CAA
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UNITED STATES ARMY
CENTER FOR ARMY ANALYSIS
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FY 99 ANNUAL REPORT

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Prepared by

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REPLY TO
ATTENTION OF:

24 FEB 2000

CSCA-MSP (5-5d)

MEMORANDUM FOR RECORD

SUBJECT: Center for Army Analysis FY 99 Annual Report

1. In FY 99 the Army experienced a more forceful push to shift away from Cold War weaponry toward equipment designed for less conventional warfare, such as smaller-scale contingencies, counterterrorism, and peacekeeping operations. In June, new Army Chief of Staff, General Eric Shinseki, told service leaders that the Army would accelerate its transformation into a more mobile force, capable of responding quickly to a greater range of threats. CAA serves in partnership with our sponsors to be responsive to the analytical demands associated with the challenges facing today's Army. We are developing and implementing new approaches to addressing force planning and response issues.

2. This year's accomplishments were as diverse as ever. In FY 99 we worked on the Army's most important problems in such areas as Future Force Development, and Operation Plan Development.

3. I welcome you to read our account of FY 99 and what may lie ahead in the future.

E. B. VANDIVER III
Director

Encl

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INTRODUCTION AND OVERVIEW

GENERAL

Report Purpose. The fiscal year 1999 (FY 99) Annual Report profiles the Center for Army Analysis (CAA) and highlights key elements of FY 99 mission performance, presents the Center's current posture, describes CAA's direction for the near-term future, and serves as the historical record of FY 99 Center activities.

Report Organization. This report is organized into seven major components starting with **Chapter 1** which provides a snapshot of what happened last year and, secondarily, provides insights as to how CAA is positioned to meet the challenges of the future. **Chapter 2** highlights major analysis activities which occurred in FY 99. **Chapter 3** is the total package of analytical summaries completed during FY 99. **Chapter 4** contains a summary of CAA's technological resources and profiles how we are positioned to meet future workloads. **Chapter 5** is a report of stewardship of CAA's personnel and financial resources. A 5- year workload history is at **Chapter 6**, followed by several **appendices**.

CAA ORIGIN, ORGANIZATION, MISSION, PRODUCTS, AND SPONSORS

Origin. CAA was formed as a result of the 1973 STEADFAST Army reorganization which combined missions, functions, and elements of the former Combat Developments Command (CDC) and the Strategy and Tactics Analysis Group (STAG), see Figure 1-1. CAA was created to function as the central force analysis activity for the Department of the Army and its leadership.

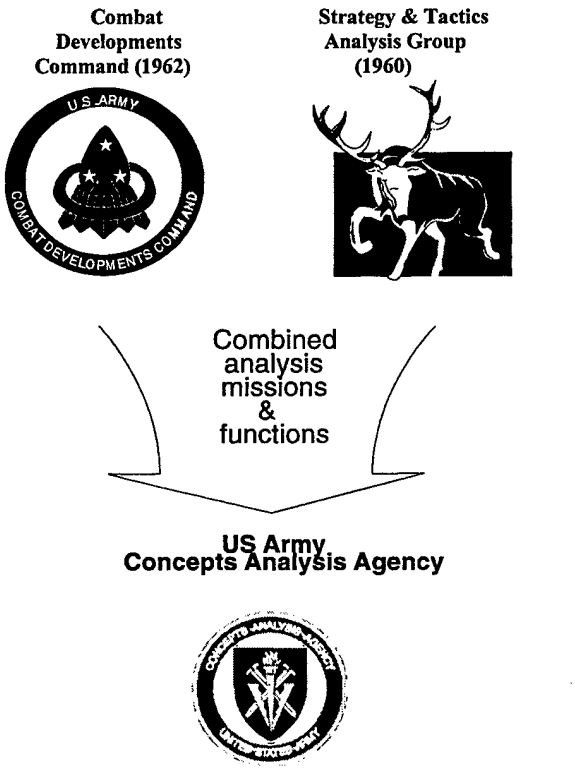


Figure 1-1. CAA History

CAA Organization

◆ CAA has evolved over the years to its current organizational structure as a field operating agency (FOA) of Headquarters, Department of the Army (HQDA). While the primary role of CAA remains to support HQDA and Army leadership, its analytic activities have expanded to encompass a wide range of analytical services performed in support of virtually all Army elements, and occasionally other Department of Defense (DOD) and US government agencies.

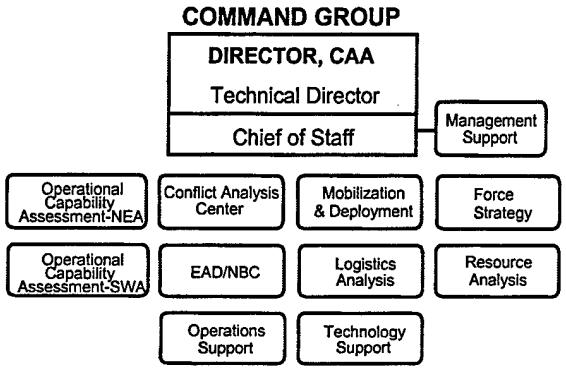


Figure 1-2. CAA Organization Chart

◆ CAA's organization (Figure 1-2) is headed by the Office of the Director, which includes the Chief of Staff and Technical Director. These two, along with the Director, oversee eight Analysis Divisions, (two of which are special elements performing operational capability assessments for Northeast and Southwest Asia) and three support divisions.

CAA GLOBAL PERSPECTIVE AND STRATEGIC VISION

The dynamic nature of the global security environment has caused significant changes in the demands placed on our Armed Forces. The Army plays a key role in defending the nation, promoting peace, and protecting US interests abroad. Army doctrine has evolved along with the changes in the global security environment. Key changes include:

- a focus on CONUS-based force projection;
- joint and combined/multinational operations;
- the need for simultaneous attack--close, deep, and rear;
- the requirements for operations other than war;
- increased need for versatility.

CAA endeavors to be in a position to play a key role in the regular review of the future vision and goals of the US Army and the US military. In doing so, we are developing new ways to quicken the process of matching resources with threats and requirements.

CAA's Strategic Plan

Mission Statement. CAA is an analysis organization that supports HQDA and major Army commands. CAA develops information that helps Army top management address the issues of greatest importance to the Army. CAA develops information by conducting studies employing analysis techniques appropriate to the issues at hand. CAA maintains special expertise in the analysis of issues pertaining to theater-level operations and Army-wide processes, especially those involving resource allocation.

CAA Goals

◆ Focus the CAA work program on the most important issues facing the top management of the Army.

◆ Provide the top management of the Army high quality, timely analytical products.

◆ Increase productivity.

CAA Mission. CAA is designated as the Center for Army Analysis, within the Army's overall analytical framework (Figure 1-3). CAA is assigned the primary mission of assessing strategies, strategic concepts, broad military options, and resource allocation alternatives, and analyzing Army force-level capabilities and requirements in the context of joint and combined warfighting.

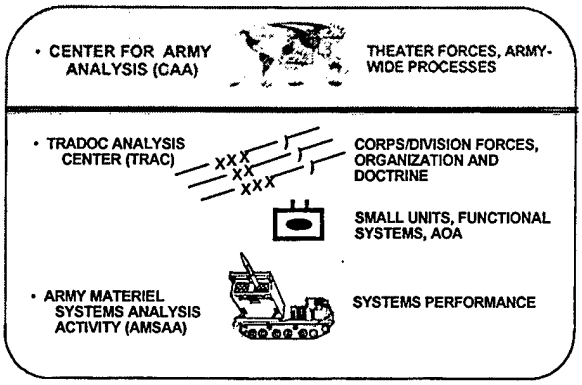


Figure 1-3. CAA Mission Within the Army Analytical Framework

As the Center for Army Analysis, CAA has the following functions:

- Perform theater-level analyses (Figure 1-4) to assist the Chief of Staff of the Army to evaluate, plan, and execute the Army's strategic force mission; assess alternative resource applications; and determine requirements and establish objectives for joint and combined theater, regional, low-intensity, and contingency forces.

- Conduct studies and assessments of strategic concepts, alternative strategies, and broad military options.

- Conduct studies and evaluations of force structure, design, capabilities, and requirements within the context of joint/combined forces for theater, regional, low-intensity, and contingency operations.

- Conduct quick reaction planning and operational assessments which address pressing issues and the conduct of war.

- Conduct studies and evaluations of the Army's capabilities to mobilize, deploy, employ, and sustain.

- Conduct assessments of force modernization programs, affordability, requirements, and tradeoffs supporting Army inputs to the Planning, Programming, Budgeting, and Execution System (PPBES).

- Conduct combat systems, combat support systems, logistic, and personnel analyses.

- Develop and maintain scenarios, models, databases, and techniques necessary to support CAA's analytical mission and functions.

- Conduct workshops which evaluate a wide range of issues to include those related to smaller-scale contingencies (SSC).

- Develop optimization methodologies to evaluate logistical and stationing problems brought on by downsizing.

- Develop strategies and program guidelines which address multifarious, energy, pollution, and environmental concerns.

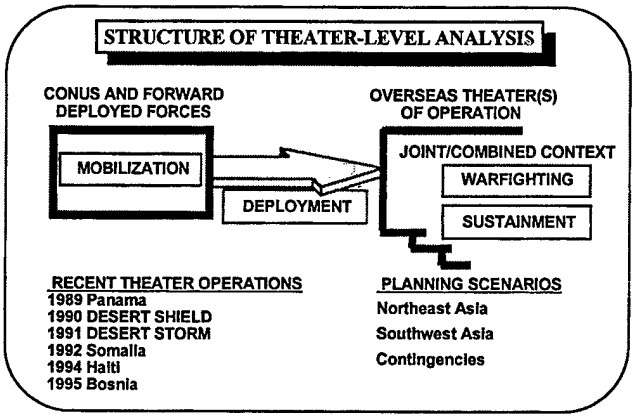


Figure 1-4. Structure of Theater-level Analysis

FY 99 HIGHLIGHTS

In FY 99 CAA worked on the Army's most important problems. Some examples of these are:

Future Force Development

- Supported CSA Initiatives
- Refined Mission Task Organized Forces
- Conducted most comprehensive, complex TAA to date

- Developed requirements for future precision munitions
- Supported Army participation in major Joint analyses; e.g., RCE-05, MRS-05, FID W-MBX
- Analyzed emerging homeland defense mission

Operation Plan Development

- Analyzed Korean OPLAN as 2d MTW
- Analyzed Kosovo-related issues
- Provided analysis support to US Army in Bosnia

Future Force Development

Total Army Analysis - 2007

The purpose of TAA-07 was to validate the US Army's combat requirements; generate the US Army's support force requirements; capture the US Army's generating force (TDA) requirements; resource the force; and provide the force structure foundation for submission of POM 02-07.

In support of this HQDA effort, CAA was tasked to conduct a suite of analyses to determine the time-phased echelons above division (EAD), combat support and combat service support (CS/CSS) force structure required to support the programmed combat force in the Illustrative Planning Scenarios (IPS) of the FY 2000-2005 Defense Planning Guidance (DPG). The major objectives were as follows:

a. Determine the EAD CS/CSS force structure required to support the programmed combat forces in the DPG Near-Simultaneous Major Theater Wars (NS MTW) Illustrative Planning Scenarios (IPS), and other sponsor specified MTW scenarios and/or excursions.

b. Determine whether the required forces in the MTW scenarios can be deployed to their respective theaters in accordance with the desired combat force arrival schedule.

c. Determine likely campaign outcomes of the DPG scenarios and other specified MTW scenarios.

d. Assess the strategic deployment impacts of an ongoing set of SSCs at the outset of hostilities in the first MTW. Align and compare (match) the 2007 programmed Army force structure (C/CS/CSS) against the SRA-07 generated required NS MTW force structure.

For each MTW IPS which HQDA identified for analysis CAA conducted its suite of theater-level force analyses consisting of a set of strategic deployment analyses, tactical combat sample analyses, tactical ballistic missile (TBM) effects analyses, weapons of mass destruction (WMD) close effects analyses, theater campaign analyses, campaign casualty analyses, and support force requirements analyses. For the set of SSC IPS which HQDA identified for analysis, CAA conducted MTOF analyses to expand the details of the scenario and determine the force structure requirements for each SSC. In addition, CAA conducted subsets of the suite of theater-level force analyses for each specified HQDA excursion requested.

The scope and set of base cases and excursions was as follows:

a. Conduct strategic deployment analyses, including consideration of mobilization, deployment, and RSOI (Reception, Staging, Onward Movement, and Integration), for the following DPG scenarios and/or excursions:

1) NS MTW East-West (w/threat chemical use) – Base Case 1.
2) NS MTW West-East (w/threat chemical use) -- Base Case 2.
3) NS MTW East-West (w/o threat chemical use).
4) NS MTW West-East (w/o threat chemical use) Deployment to NS MTW East-West with "Moderate" posture of engagement (POE) ongoing.

b. Conduct campaign analyses, from threat attack through conflict termination (exploitation), for the following DPG scenarios and/or excursions:

1) NS MTW East-West (w/threat chemical use) – Base Case 1.
2) NS MTW West-East (w/threat chemical use) -- Base Case 2.

3) NS MTW East-West (w/o threat chemical use).

4) NS MTW West-East (w/o threat chemical use).

5) NS MTW East-West (w threat chemical and biological use).

c. Conduct US Army support force (CS/CSS) requirements analyses, including US Army logistics support to other services (ALSOS), for the following DPG scenarios and/or excursions.

1) NS MTW East-West (w/threat chemical use) – Base Case 1

2) NS MTW West-East (w/threat chemical use) -- Base Case 2

d. Conduct a force alignment (match) analysis comparing the US Army's programmed force to the required force generated by the above support force (CS/CSS) analyses. Force alignment analysis will be conducted on the Base Case 1 DPG scenario.

TAA-07 was the most comprehensive set of TAA analyses CAA has conducted for HQDA to date. Many new analyses were included in the base case results as well as much greater level of detail and fidelity for the usual set of TAA analyses. The following major new analyses were accomplished for the first time in TAA-07:

- Force XXI divisions' warfighting capabilities (Base Cases)
- Postures of engagement as start point for deployment to the MTW scenarios (Excursion)
- End-to-end deployment analyses (Base Cases)
- Threat use of WMD – chemical (Base Cases)
- Threat use of WMD – biological weapons (Excursion)
- Mission task organized forces (MTOF) analyses for each of the postures of engagement, base engagement force (BEF), base generating force (BGF), MTW Post-hostilities, and a set of Homeland Defense scenarios.

The complete set of CAA base case analyses were completed in late April 1999, briefed at General Officer Study Advisory Group (GOSAG) 3, and approved in May 1999. The remaining excursion analyses were completed in August 1999, briefed at the Resourcing Council of Colonels and GOSAG, and approved on 1 November 1999.

Total Army Analysis 2007 - Base Case / Deployment Analysis - Chemical (TAA-07 BC/DA - CH). This study examines the strategic mobility implications for the US Army forces identified to support the National Military Strategy as stated in the FY 2000-2005 Defense Planning Guidance. This analysis, sponsored by the Office of the Deputy Chief of Staff for Operations and Plans (DAMO-SSW), focused on the DPG illustrated planning scenarios for the Major Theater War near-simultaneous (East then West and West then East) scenarios. It addressed the degradation effect on the deployment when WMD are used by the enemy on air/seaports of debarkations. The results of these analyses provided critical inputs such as closures of combat and other enabling units, buildup of CS/CSS units and of sustainment stocks to the campaign analysis phase to assist in development of the TAA campaign plan. The Computer Assisted Match Program (CAMP) was used to develop the Army movement requirements used in the deployment analyses. The Global Deployment Analysis System was used in the analysis of each of the deployments.

Total Army Analysis 2007 - Postures of Engagement (TAA 07 - POE). US Army forces identified to support a major theater war (MTW) as stated in the FY 2000-2005 Defense Planning Guidance may be engaged in ongoing small-scale contingencies at the onset of the MTW. Redeployment of these forces to the MTW and deployment of backfill forces may affect the course of the deployment. The Office of the Deputy Chief of Staff for Operations and Plans (DAMO-FD) sponsored this study requesting a deployment analysis that drew from the DPG Illustrated Planning Scenario for the near-simultaneous MTW (East then West) and the SSC scenarios based on the moderate posture of engagement. This study was performed as an excursion of the Total Army Analysis 2007 - Base Case/Deployment Analysis - Chemical (TAA-07 BC/DA - CH).

The main focus of this excursion was to determine the effect units deploying from the SSC to the MTW have on the arrival schedule of the major combat units and selected support units, and whether it would have any impact on the campaign plan developed for

TAA-07. As part of this analysis, time-phased Army movement requirements were developed for the required Army MTW forces to reflect origins and destinations of units engaged in the individual SSC. Using these requirements, a deployment analysis for near-simultaneous MTW (East then West) was conducted. The results of this analysis were compared to the base case deployment to determine differences in the arrival schedules of the force. The Global Deployment Analysis System (GDAS) was used in the analysis of the deployment.

Total Army Analysis - 2007 - Transshipment Operation (TAA-07-TO). This project examines the strategic mobility implications for the US Army forces identified to support the National Military Strategy as stated in the FY 2000-2005 Defense Planning Guidance deploying into airfields/seaports under threat of chemical attack. This study was performed as another excursion of the Total Army Analysis-2007 - Base Case / Deployment Analysis - Chemical (TAA-07 BC/DA - CH).

The Office of the Deputy Chief of Staff for Operations and Plans (DAMO-SSW) sponsored this study requesting a deployment analysis to determine the effect on the deployment into a theater attacked by weapons of mass destruction. This analysis utilized the concept of transshipment of cargo from civilian aircraft to organic lift at a staging base and other deployment options. The focus of this study was to develop a deployment scenario for a near-simultaneous MTW (East then West) within the WMD environment and conduct this deployment analysis. The result of this excursion was compared to those of the TAA-07 base case deployment to determine differences in the arrival schedules of the major combat units and selected support units and whether it would have any impact on the campaign plan developed for TAA-07. The Global Deployment Analysis System was used in the analysis of the deployment.

Chemical Casualty Integration Analysis (CCIA). The Chemical Casualty Integration Analysis (CCIA) analysis was sponsored by the Casualty Estimation Steering Committee in preparation for anticipated chemical casualty play in the Total Army Analysis – 2007 (TAA-07).

The objectives of this effort were to: (1) explore the possible methodologies for integrating chemical casualties with conventional casualties; (2) identify the chemical casualty issues, both of policy and methodology; (3) develop a means for integration which had the approval of the casualty community. (4) identify the direct (or first order) effects on medical, mortuary affairs, and replacement force structure.

The principal findings were that: (1) the methodology used for the analysis, that of using the chemical casualties from the Force Evaluation model (FORCEM) and the conventional casualties from Concepts Evaluation Model (CEM), should be sufficient for purposes of assessing the casualty, replacement and mortuary affairs force structure needs for TAA-07 or any other study until the time that the CEM-FORCEM linkages are improved. However, the modeling of some chemical casualty categories, such as noncombatants, enemy prisoners of war, and contractors (which were not modeled in this QRA) should be accomplished in the future. (2) Other chemical casualty types may easily be added to the casualty streams for future studies since the Patient Flow Model (PFM) run-stream was modified to use script-specified accumulation and disposition (ACD) tables, and a table-building program was put in place which facilitates the building of new agent-specific ACD tables. (3) Chemical casualties had a significant impact on the medical and the replacement unit force structure in this QRA but no significant impact on the mortuary force structure. The use of chemicals on the battlefield also had the effect of delaying campaign phases.

The recommendations were that: (1) the method developed in this QRA be used to estimate and process the chemical casualties generated for TAA-07. (2) The Army Medical Department (AMEDD) Center and School review the results of this QRA and the ACD tables for chemical casualty care and provide any changes to the ACD tables or the allocation rules for medical force structure that should be used for TAA-07. (3) The Casualty Estimation Steering Committee (CESC) approve the methodology depicted in the study and sponsor a QRA for a similar look at biological casualties. (4) The linkages between models (CEM, FORCEM, CARAT, etc.) be reviewed and improvements made to better portray the effects of enemy chemical and/or biological use. (5) The programs, linkage tools, and

scripts which were incorporated in the methodology be documented in a user handbook.

Chemical Campaign of SRA-07 (ChemCamp-07). This study evaluated the differences between major theaters of war (MTW) scenarios in Southwest Asia attributable to threat use of chemical weapons of mass destruction. The scenarios analyzed were limited to those primary scenarios used for force structure decisions based on Defense Planning Guidance Illustrative Planning Scenarios (DPG IPS). Overall, the SRA-07 study objectives include building/tailoring force structure to meet requirements suggested by campaign simulation results.

This analysis was the most closely scrutinized DA-sponsored project ever serviced by the Center for Army Analysis. Numerous enhancements were incorporated into the modeling process to support the campaign analysis. Major design revisions included digitization of forces, modeling preferred munitions, increased chemical play during the campaign. The results of this critical study will be used by the senior Army leadership to influence program and budgetary decisions as the basis for US Army support force structure for the next POM.

Analytical Support to the Chief of Staff, US Army, Support Force Impacts (CSASPT-LD). This project's purpose was to explore the sensitivities of force structure requirements with respect to a set of five proposed redesigned divisions developed by the Chief of Staff's, Army (CSA) Initiatives Group. The set of five designs attempts to improve the Army's responsiveness to more quickly deploy combat power to both major theaters of war (MTW) and smaller-scale contingencies (SSC) while minimizing the acceptance of risk in warfighting capability in the MTWs. The sensitivity analyses foci were on the changes in sustainment requirements in the MTW campaigns and the resultant impacts on support force requirements for the MTWs.

A summary of the results of the sensitivities is as follows: the preponderance of savings in force structure requirements for all five designs was primarily due to the reduced size/strength of the divisions with very minor reductions in support force requirements and in some cases minor increases in support force requirements. A limitation of the analyses given the quick turnaround time required was that we were unable to effectively adjust the major planning factors which drive support force requirements, specifically fuel and maintenance.

As the divisions were made lighter with slightly less capable weapon systems, the overall consumption of ammunition (tonnage) increased marginally while the number of casualties suffered by US Army forces also marginally increased.

Although support force savings were lower than expected by the sponsor, we clearly identified what major data input areas require updating prior to completing a more comprehensive analysis with a very well defined "new" divisional force structure.

Chief of Staff of the Army Special Project - SWA (CSASP-SWA). The CSASP-SWA study evaluated several medium weight force alternatives for the Deputy Chief of Staff for Operations and Plans in response to the Chief of Staff's strategic responsiveness initiative. The objective was to analyze several force structure alternatives to determine the appropriate course of action to pursue that will increase the strategic responsiveness of friendly deployed forces.

The underlying assumption used was that the coalition forces would still be able to achieve their campaign objectives despite the reduced lethality and survivability of medium weight forces by making appropriate adjustments to the operational concept as necessary.

The principal finding of the study indicated that as long as one corps remained homogeneous and heavy, there was sufficient firepower in theater to achieve the campaign objectives. It is better to maintain a homogeneous force package during a battle to exploit the technological and weapon system superiority enjoyed by the US. Other key observations included:

- CS support packages, specifically artillery support, need to possess comparable mobility and lethality for the type of unit it supports. Direct support artillery supporting a heavy maneuver force must be self-propelled to keep up with offensive operations

- Light infantry brigades within the Full Spectrum Division have no impact on the campaign because they are not mobile and lack lethality to fight a heavy maneuver force

- Medium Brigades have little impact on the campaign because they lack lethality to fight the enemy modernized T72 and T90 tanks. Medium brigades would have to be given appropriate missions to participate in a heavy maneuver environment. Appropriate missions for the medium brigade operating in a heavy maneuver environment would be to either screen the flanks of the division, maintain contact between units or engage reduced or bypassed forces.

- Only a small portion of the total strategic lift requirements requires moving combat assets. Modifying the composition of the combatant forces will minimally effect the overall strategic lift requirements for the SWA theater. To be more strategically responsive, measures need to evaluated to limit the logistics requirements.

Objective Force Planning (OFP). The development of the Objective Force Planning (OFP) Process exemplifies this category of work. It started with strategic military objectives shaped by tenets of the National Military Strategy subsequently reduced to MTOF requirements. This was subsequently used for the Dynamic Commitment Force (DCF) Joint Workshop, a resources-driven endeavor. The DCF Workshop focused on two possible timeline scenarios, both variations of a consecutive major theater war scenario. It is the Army's position that there are more possible contingencies and therefore a baseline engagement force is required -- a force that would not employ the rotational forces identified for the MTWs as a wedge for various combinations of smaller-scale contingencies.

To that end, our goal is to integrate a further elaborated OFP process into the Total Army Analysis process and thereby permit quicker turnaround analyses of force requirements from available resources. If we are able to efficiently analyze and plan for true requirements alternatives, we may be able to allocate forces fairly without overextending any portion of the total force.

Operation Plan Development

Campaign Concept Analysis (CCA). The Combined Forces Command (CFC), Korea C5 Plans action officer asked CAA to complete some initial analysis comparing 5027-98 concepts and wargaming results with the current 5028-96 CONPLAN, since the 5028 CONPLAN is approaching 3 years in age.

The purpose of this study is to address the development of a 5028 CONPLAN update concurrently with the final development stages of the CFC, 5027-98 OPLAN. The study focuses on the differences between the updated 5027 force flows and campaign phase timings and those of the wargamed 5028 CONPLAN-96. The intent is to ferret out issues germane to updating 5028 CONPLAN for consideration and further analysis. The main issues addressed are the force flow differences between 5027 and 5028 Time-Phased Force Deployment Data (TPFDD), Operational Combat Power, and the timing of phases of a 5028 scenario campaign. The 5028-96 CONPLAN excursion is based on OPLAN 5027-98 scheme of maneuver and threat estimates. The study analysis covers campaign Phases II-IV. The report discusses the results of the simulation in terms of the forward edge of the battle area (FEBA), force commitment timings, and operational implications.

Brcko (BERCH-ko) Informatics Project (BIP). Under The Dayton Agreement (for Bosnia and Herzegovina), all refugees are guaranteed the right to return home. However, the rules also protect those who might currently be living in homes that the refugees may want to return to. Furthermore, in all cases, basic infrastructure must be available prior to allowing the resettlement.

Assistant Ambassador Ferrand, the Brcko head of the Office of the High Representative, requested assistance from Task Force Eagle in tracking the returns of displaced persons and refugees (DPREs) in the city and opstina (country) of Brcko. The town of Brcko in Bosnia and Herzegovina represents an initial bellweather in the DPRE process. The objective was to conduct an analysis of the proposed DPRE process of Brcko, and build an analytical tool to assist in the DPRE process.

Air Sensitivity Korea (ASK). CAA was tasked by the Chief, War Plans Division, Strategy and Plans Directorate (DAMO-SSW), Deputy Chief of Staff for Operations and Plans, to provide sensitivity analyses on the impact of air wings engaged in Kosovo on the Denial Phase of the Korean Theater Campaign.

The purpose of the quick reaction analysis was to determine how many fighter wing equivalents (FWEs) could be engaged in Kosovo without breaking the Korean Theater Campaign (Phase II). The study was restricted to the current time-frame and examined the loss of US Air Force assets only. The assumption was made that the last squadrons scheduled to deploy to Korea would be the first to deploy to Kosovo.

The key findings, which are classified, include measures of effectiveness (MOE) such as the expected level of nK penetration in the mobility corridors per the various excursions.

FY 99 ANALYSIS PROGRAM OVERVIEW

General. In support of the national security and national military strategies, CAA provides analysis of the means to accomplish the national military objectives in various ways. Commonly known as the ends-ways-means test of the national military strategy, it is the method by which the US government tries to keep all three aspects in balance.

The purpose of CAA's analysis program is to evaluate the means proposed by Army leadership of applying military force to satisfy the ends; ends being the national military objectives supporting the National Security Strategy. Since the end of the Cold War, our mission has expanded to include a sizable investment in studying ways to efficiently manage the Army's declining resource base. Figure 1-9 depicts how closely our analysis workload correlates with the problems faced daily by national decision-makers.

Following Figure 1-9 is a list of key FY 99 study completions for the following six study categories:

- Force Development/Capability Analysis
- Political-Military Analysis/Arms Control
- Operational Strategy
- Optimal Use of Resources/Requirements Analysis
- Planning Data/Factor Development
- Tool and Methodology Development

In Chapter 2 we feature some of these analyses. Chapter 3 contains a brief summary for all FY 99 analysis completions. Chapters 4 and 5 show how we are equipped and staffed to meet these requirements.

Decision-makers are often confronted with the need to make decisions quickly. To assist them in the decision making process, CAA performs quick turnaround analyses. In times of war, CAA exercises its various analysis tools to assist the DA decision makers in strategy and force evaluation analyses. In "normal" times, CAA analysts must be ready to interject our suite of resource and force analysis ***models and analysis tools*** into the DA ***planning and programming*** cycles.

Analysis resources are scarce, and the demand for quick turnaround of information compels CAA to be ***in the loop*** on short-, medium-, and long-term planning cycles. Each year we are asked to integrate Army planning processes with the rest of the Defense establishment to achieve a level of synergism to carry us through this period of declining Defense dollars. CAA endeavors to stay in step with the ever-changing political-economic environment.

CAA *strategic partnerships* have been initiated to ensure that CAA remains *in the loop* on important Army issues as they develop and to interface with principal supported elements in DCSOPS. This program is further elaborated on in Chapter 2.

Products. CAA's primary products are documented analyses. Analyses range from large, long-term efforts to short, quick turnaround efforts.

Inputs. Work comes into the Center via various avenues. There are the well-traveled routes built over many years of supporting traditional sponsors in their annual requirements. Increasingly, there are ad hoc situations which travel these same routes such as a major theater war (DESERT STORM), or a major program review such as the Quadrennial Defense Review (QDR).

New customers and workload travel a more circuitous route, usually ending at a point where the demand for our services meets the supply of unfilled analysis requirements. Workshops, conferences, word-of-mouth, and other forums could be the genesis of a working relationship between CAA and new customers. We are always willing to open new avenues to support new customers.

Outputs. Figure 1-5 illustrates the number of analytical products CAA delivered to sponsors over the past 12 years, peaking at 120 this year. Figure 1-6 illustrates the broad spectrum of support to sponsors. Both charts reflect high achievement when considering that we have experienced a significant decline in resources over the same period, a decline which has only recently stabilized.

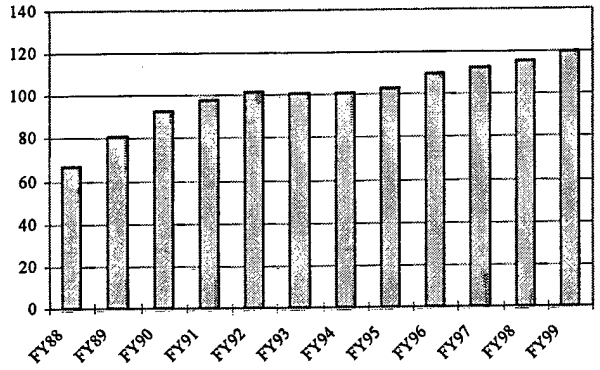
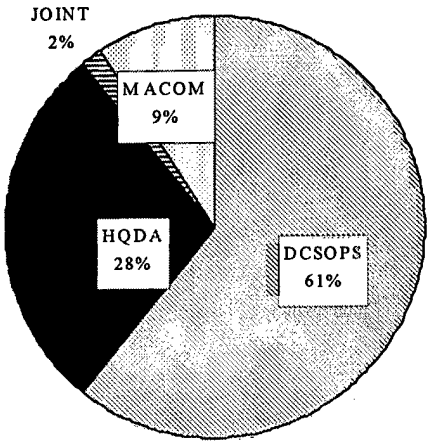


Figure 1-5. Number of Analytical Products Delivered to Sponsors



MACOM	HQDA		Joint
ARCENT	ACSIM	OCSA	JCS
EUSA	ASAILE	OSG	OSD
TRADOC	DCSINT	TAPC	
USA SMDC	DCSPER	VCSA	
USARPAC	DUSA(OR)		

Figure 1-6. Studies and QRA Delivered to Sponsors

Future Considerations. To maintain our viability in the face of continuous change in the Defense environment, we must be receptive to new information. We must take this information and incorporate it appropriately into our processes, and we must continue to monitor for change.

Problem solving in the post-Cold War era requires us to focus on the activities that traditionally have not been programmed and that require creative analytical thought. This type of creative thought is fostered in various forums at CAA such as workshops, political-military games, and management planning conferences. Ultimately, however, CAA must incorporate logic into computer-based models and simulations that complement the human ability to observe, recognize, discover, and generate creative ideas. Without it we would have to increasingly rely on heuristics to develop reasonable answers to modern threats, or else be forced to portray current scenarios to fit old models. The longer we can maintain our modeling and technology edge, the better we will be positioned to meet this level and mix of analyses.

Customers. CAA's primary mission is to provide analytical support to HQDA and Army leadership. CAA analysis support is also provided to major

Army commands, other Army activities, and occasionally DOD and US government agencies. Figure 1-6 presents a proportional breakout of CAA's FY 99 analysis support to all sponsors.

A gradual and steady change in emphasis to CAA's workload sponsorship had its genesis in 1986 with passage of the Department of Defense Reorganization Act, known as the Goldwater-Nichols Act. This act established the command relationship between civilian authorities, the Chairman of the Joint Chiefs of Staff (JCS), the JCS, the commanders in chief of the combatant commands (CINCCs) and the Service chiefs. In short, it gave the CINCCs improved access in the National Command Structure.

In CAA's case, it gave greater emphasis to analysis support of Army components for the Unified Commands. In 1987, 7 percent of CAA's workload and professional staff time was in support of such Army components, referred to as "Joint" and "MACOMs" in our system of accounting. This number has been as high as 22 percent last year; and this year is somewhat lower at 11 percent

Productivity. Productivity has increased steadily for 6 years. Fifty-six percent since FY 93, 12 percent last year based on the efforts of our people. The productivity chart (Figure 1-7) which follows bears out this observation.

Process Improvements

- Number of Process Action Teams (PATs): 13
- Process Reviews held for:
  - Quantitative War Reserve Requirement for Munitions Process
  - Systems Characteristics
  - Support Force Development using FASTALS
  - Personnel Casualty Estimation and Replacement
  - Extended Air Defense/NBC Process
  - Deployment Analysis
  - Combat Sample Generator Process
  - Mobility Requirements
  - Total Army Analysis Process
  - Political Military Gaming

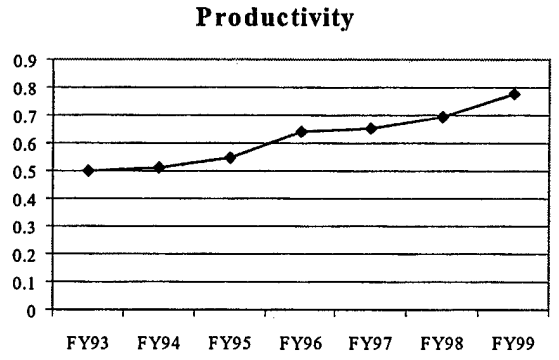


Figure 1-7. CAA Productivity Trend
(scale=analysis products per 10 PSY)

Taken together, these achievements reflect the dedication of CAA's work force and the positive contribution of CAA's Total Quality Management (TQM) program.

RESOURCE TRENDS

As can be seen in Figure 1-8, CAA's decline in budget and manpower has stabilized over the past 4 years. We have managed this decline through hiring freezes and careful planning of our discretionary spending. A stabilization in both resource categories is projected by current planning documents.

CAA has increased productivity through a proactive total quality management program, ongoing research and analysis activities, improved technologies and methods, and a robust training program. Future productivity gains depend on sustaining the hard-earned momentum built up in each of these resource areas over the preceding years.

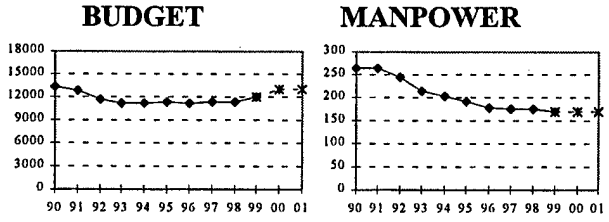


Figure 1-8. FY 99 CAA Resource Trends

SUMMARY

Thus far, this report has touched on the workload and resource challenges facing CAA and the organization, equipment, and tools necessary to efficiently and effectively produce the highest quality and quantity of products possible.

In the coming chapters are specific examples of the investments CAA has made to produce quick turnaround, multifaceted analyses; and the strides which have been taken to reorganize and reequip in such a way to meld assets to maximize productivity and thereby remain responsive to our sponsors' analytical needs and performance expectations.

Also in the coming chapters are highlights and descriptions of CAA FY 99 accomplishments which are the results of these investments and indicative of things to come.

CAA SUPPORT TO THE NATIONAL SECURITY STRATEGY

ENDS	WAYS	MEANS	CAA Analysis
Enhanced Security	•Shape International Environment	•Military Exercises & Training	•Force & Capability Development
	•Enhance Force Capability	•Force XXI	
Ability to Respond to Threats & Crises	•Small-scale Contingencies •Major Theater Warfare •Simultaneous Operations	•Rapid Deployment •Adaptive Joint Force Packages	•Operational Strategy •Pol-Mil Analysis
Preparedness for an Uncertain Future	•Force Modernization	•Force Enhancers & Force Multipliers	•Optimal Use of Resources & Requirements Analysis
Enhanced Capabilities & Technologies	•Technology Sharing •Improved Efficiency	•Information Technology •Reinvention	•Tool and Methodology Development •Planning Data/Factor Development

Figure 1-9. CAA Support to National Security Strategy

EXAMPLE ANALYSES UNDER CAA WORK CATEGORIES

FORCE DEVELOPMENT/CAPABILITY ANALYSIS

OFP New and Extended (ONE)
MEADS Cost-Share Analysis Phase I (MEADS-CSA-I)
MEADS Cost-Share Analysis Phase II (MEADS-CSA-II)
FastShip Atlantic NDF Proposal: Quick Reaction Analysis (FSQRA)
TF HAWK Deployment Methodology Analysis (TF HAWK)

POLITICAL-MILITARY ANALYSIS/ARMS CONTROL

Joint Pacific Arms Control Study Phase III -Chem- Bio Nonproliferation IW (NAMSAN 99)
PATRIOT SHIELD 98 Political-Military Game (PS 99)

OPERATIONAL STRATEGY

Very Rapid Deployment (VRD)
Very Rapid Deployment by Air and Sea (VRDAAS)
Potential Rapid Assessment and Initial Detection Sitings (PRAIDS)

OPTIMAL USE OF RESOURCES/REQUIREMENTS ANALYSIS

Modeling of Restoration Technology and Investments (MORTI)
Modeling to Optimize Restoration Tech & Investments II (MORTI-II)

SUPPORTING ANALYSES

PLANNING DATA/FACTOR DEVELOPMENT

Joint Service Chemical Defense Equipment Consumption Rates 4 (JCHEMRATES IV)

TOOL & METHODOLOGY DEVELOPMENT (in support of operational and FD strategies)

Analysis of Complex Threats (ACT)
Brcko (BERCH-ko) Informatics Project (BIP)
Non-Combatant Evacuation Operation - Simulation Model (NEO-SIM)

Note: The status of ongoing model developments such as ARES, GDAS, and MOBCEM are detailed in Chapter 4.

Summaries follow in Chapter 3.

ANALYTICAL EFFORTS OF SPECIAL INTEREST

INTRODUCTION

This chapter is presented in five sections. First are activities deserving special mention which occurred in FY 99. Next are studies that the CAA divisions deem their most notable works for the FY (Analysis Areas of Interest).

Section III describes CAA's contribution to "Shaping the International Environment" by taking part in National and International Military Operations Research Activities.

Section IV gives special mention to individuals, within and from outside CAA, whose participation in and contribution to our study program were most notable.

Section V describes CAA internal management efforts to focus on maintaining cooperation throughout the Center in the form of management planning conferences.

Section I. SIGNIFICANT ACTIVITIES

REVOLUTION IN ANALYTICAL AFFAIRS

CAA performed a study to analyze the changes that have occurred in the analytical community's capability and responsiveness to customer demands since the end of the Cold War. Additionally, the purpose of this project was to determine likely future trends in the analytical and customer environment, and recommend action best suited to meet these future challenges.

The results of this study are:

➢ There is an ever-increasing demand for quick turnaround analysis due to:

- The Army being in a period of accelerated change.
- The rapid technology turnover.
- The increase in quick response funding questions.

➢ There is greater quantity and more diverse scope to the types of analyses required. Some of the reasons this is true are:

- Systems are more complex, and there is a broader threat spectrum.
- There is more emphasis on joint context.
- There is a growing demand for analysts to work as members of an integrated team.
- Customer staff decreases cause increased demands for analysis support.
- There is need for more analysis that is -
  - Resource tradeoff in focus and not directly related to warfighting, e.g., infrastructure, environmental policy impact.
  - Broader in operational context, e.g., smaller-scale contingencies (SSC), Homeland Defense, weapons of mass destruction scenarios.
- A key recommendation of this study is the development of strategic partnerships between the analysis community and its customers.

CAA STRATEGIC PARTNERSHIPS

CAA strategic partnerships have been initiated to facilitate an analytical support interface with principal supported elements in DCSOPS and to ensure that CAA remains in the loop on important Army issues as they develop. This concept is put in effect in several ways. Individual analysts have been placed in supported organizations to provide hands-on, immediate analytical support to our sponsors. In addition, key CAA leadership take part in the weekly staff meetings of principally supported organizations.

Reinventing the Customer/Analysis Interface. In order to extend the analytic interface into the customer environment, CAA implemented a plan

whereby CAA analysts become integral team members in the customer environment. Implementation can vary as a function of the customer. The range of options includes:

- Full-time on site "forward-deployed" analysts.
- Dedicated customer interface team with frequent and on-call visits.
- Attendance at customer staff call and planning meetings.

Strategic partnerships that have been established to date are depicted in Figure 2-1.

CAA STRATEGIC PARTNERSHIPS

ORGANIZATION	INSTRUMENT	MODE
DCSOPS	Terms of Reference (TOR)	CAA Analysts in Key Divisions. Director attends DCSOPS Weekly Director's Meeting & Off-Sites
DCSLOG	HQDA Redesign Mission Agreement	Director attend DCSLOG Weekly Director's Meeting
ACSIM	Verbal Agreement w/MG Whaley	Chief, Resource Analysis Division attends Weekly Director's Meeting
FORSCOM	Memorandum of Understanding (MOU)	Periodic visits, e-mail
ARCENT	Memorandum of Understanding (MOU) MOB TDA Aug	Peacetime - visits, e-mail Exercises - DAST deploys w/HQ Wartime - DAST deploys w/HQ
EUSA/USFK		Visits, e-mail

Figure 2-1. CAA Strategic Partnerships

The objectives of the strategic partnerships are to:

- Better understand sponsor issues, actions, and milieu to identify analysis support needs.
- Propose recommendations and alternatives for analysis support.
- Provide on-site analysis or arrange for CAA analysis (or support by other analysis organizations).
- Assist in the integration of analysis into DA Staff actions and activities.

NEW IN FY 99

Each year analytical techniques are developed to better support our customers, and new opportunities present themselves for analysis. New activities/analyses employed for the first time in FY 99 at CAA are:

- First dual MTW campaigns including chemical warfare.
- First theater ballistic missile defense campaigns using EADSIM.
- First dual MTW campaigns including biological warfare.
- Developed new methods for projecting future instability around the globe.
- Implemented a CAA information system to facilitate management and administrative tasks using standard electronic report formats transmitted over the local area network (LAN).
- Developed capability to streamline CAA briefing preparation and report documentation using standardized templates, formats, and software packages.

Section II. ANALYSIS AREAS OF INTEREST

CAA analyses assist in determining wartime requirements during operational contingencies and "peacetime" requirements. To that end, CAA's role is to achieve an understanding of our sponsors' purposes and from these a reasonable deduction of their objectives; and through our models and other methods, to assist them by answering their questions.

During FY 99 we worked on a number of the Army's most important problems. These are highlighted in Chapter 1. Force planning studies, with marked differences in US Army configuration and function, promise to occupy a large part of our attention well

into the next century. In the years to come, CAA's mission promises to be even more diverse.

To follow are descriptions of CAA divisions' most notable analyses performed during FY 99, presented in the categories first mentioned in Chapter 1 and which again are:

- Force Development /Capability Analysis
- Political-Military Analysis/Arms Control
- Operational Strategy
- Optimal Use of Resources/Requirements Analysis
- Planning Data/Factor Development
- Tool and Methodology Development

FORCE DEVELOPMENT/CAPABILITY ANALYSIS

Longer-range strategies may be based on estimates of future interests, threats, objectives, and requirements and are therefore not as constrained by current force posture. These long-range strategies are more often global in nature and may require improvements in military capabilities. Military strategies can be regional as well as global, concerning themselves with specific threat scenarios.

Note: Total Army Analysis Support is highlighted in Chapter 1 under FY 99 Highlights.

Mission Tasked Organized Forces (MTOF) and the Objective Force Planning (OFP) Process. The goal of the MTOF effort is to provide the Army a vehicle to capture force requirements across the entire spectrum of Army operations. These force requirements include smaller-scale contingencies, base engagement forces, base generating forces, major theater wars, and other operations. The immediate goal was to produce requirements for the Total Army Analysis (TAA) process. War Plans Division, Office of the Deputy Chief of Staff for Operations and Plans, sponsored this effort.

The MTOF process originated with the Objective Force Planning (OFP) methodology. This process was developed in direct response to the Liebermann Amendment (1996) and its provisions for a Quadrennial Defense Review in 1997. Used with success during QDR, the process was expanded and revised in early 1998 to include the myriad of Army MTOE and TDA units in a variety of operations in every geographical command's area of operations.

The MTOF process uses a top-down approach. Missions are derived from the National Military Strategy/National Security Strategy and the Defense Planning Guidance. The situations and threats are developed with assistance from the intelligence community and other experts. Using the mission and situation, the commander's intent and concept of operations are developed. Once provided with the basic information, working groups develop supporting objectives along with associated conditions and standards. From these standards, essential tasks are derived. Although the primary source of tasks comes from the Universal Joint Task List (UJTL), other sources such as The Army Plan are used. In some cases, the working group may develop tasks not referenced elsewhere, especially for base engagement forces/base generating forces. With each task, additional conditions and standards are generated as needed. Then the working group determines the units or force elements needed to accomplish the task to standard. The unit may be MTOE or TDA, or it may be one developed by the working group if unique. These individual units are then consolidated by objective, then by mission. The result is a Mission Tasked Organized Force, which can be linked to a mission or task under the Defense Planning Guidance and/or the National Military Strategy/National Security Strategy.

The current effort started in early 1998. Since then, three workshops and several other meetings have resulted in the development of 14 MTOFs for use in the Total Army Analysis process. These MTOFs include the following operations: peacekeeping, humanitarian assistance, noncombatant evacuation, interdiction, counterdrug, and homeland defense. Additional MTOFs have also been used in other analytical efforts. Currently, development of additional MTOFs is starting for the upcoming Dynamic Commitment wargames in FY 2000.

MEADS Cost-Share Analysis Phase I (MEADS-CSA-I). The Medium Extended Air Defense System Cost Share Analysis (MEADS-CSA-I) conducted a preliminary analysis of the equitable Ballistic Missile

Defense Organization (BMDO)/Army cost share percentages for the MEADS program. The methodology for recommending which portion of the MEADS program BMDO versus the Army should fund was based on both a threat-based and an employment-based analysis. The threat-based analysis partitioned potential MEADS targets by threat type for three scenarios (NEA, SWA-S, and SWA-N). The analysis assumed that BMDO should be responsible for funding potential engagements of tactical missiles (TMs) and that the Army should be responsible for funding potential engagements of air breathing threats (ABTs) in the corps. The analysis considered two timeframes, 2010 (when six MEADS battalions will be employed at corps) and 2025 (when MEADS is expected to replace Patriot at echelons above corps (EAC)). Results from these three scenarios were averaged.

The employment-based analysis examined mission and frequency of employment to determine cost share. Although defending the maneuver force is an Army mission, MEADS may be expected to defend air bases and ports as well as support USMC missions. The employment-based analysis assumed that the Army should be responsible for funding only Army tactical missions.

The analysis examined two variations on each of four operational uncertainties. The resulting eight percentages of cost sharing that are generated for each scenario are averaged together to arrive at a single value for each scenario. Percentages from each of the three scenarios are then averaged together to arrive at a single value for each time period.

TF HAWK Deployment Methodology Analysis (TF HAWK). Part of MD work for CSA Strategic Responsiveness study analyzed the deployment time of TF Hawk—Army task force of helicopters and other combat elements moved to Albania to support operations against Serbians in Kosovo. One finding showed that, using Air Force planning factors, TF Hawk could have closed in 8 days of 24 hour operations rather than the 30 days that it actually took. This finding prompted great interest at CSA and DCSOPS level because of the voluminous bad press given the Army over the perceived slowness of deployment. DAMO-SS asked CAA to expand on the initial analysis and provide a briefing and some slides for inclusion in the SECDEF Kosovo Quick Look. A request came down Thursday for a Monday briefing. The product expanded upon earlier analysis. Further research with participants confirmed basic numerical analysis and gave supporting allegorical information. BG Swannick, DAMO-SS, directed that three CAA briefing charts be added to the Joint briefing. These charts showed deployment times based upon: airlift as only limiting factor, Maximum On Ground (MOG) as an additional limiting factor, and those limits plus the limits on flights caused by higher priority of humanitarian missions. Bottom line showed that "size" of Army force was not the critical factor. The main reason for length of deployment was low priority given to flights of combat forces and allocation of a small corner of a parallel landing strip for Army use compared to the entire commercial apron used for humanitarian and other flights.

FastShip Quick Reaction Analysis (FSQRA). DCSOPS Technical Advisor, Mr. Bettencourt, asked CAA to "analyze a 40-knot ship" with turnaround time of 1 week. Analysis showed that the ship in question was a commercial proposal by FastShip Atlantic. The company plans high speed container service between Philadelphia and Cherbourg, France and wants government money to incorporate National Defense Features (NDF) into one ship that the government could call up for service (similar to Civil Reserve Air Fleet (CRAF) airlift). Data gathering and discussion with the company identified significant confusion within the Pentagon sections over just what the proposal really was. The perception of Pentagon action officers was that $40M would buy us four ships that could carry 60 percent of the load of an large medium speed roll on roll off (LMSR) at 40 knots and draw 10 feet of draft. Reality was that the proposal was for a single ship that could carry between 2K and 10K Short Ton (STON) of cargo at about 37.5 knots for a limited range and had similar draft to LMSR. This information was delivered in slide briefing format and included direct quantitative comparison between FastShip and LMSR characteristics. This was the first useful analysis of this proposal. The company had lobbied Army Science Board and Assistant Secretary of the Army for Acquisition, Logistics, and Technology for over a year before anyone did any comparative analysis.

FastShip 2 (FSII) was an amplification of the FastShip Atlantic study. It refined three specific issues: equipment loading and unloading times for Ro/Ro operations, ship draft, and relative performance in rough sea states. The study found that FastShip loaded and unloaded about 24 percent faster than a LMSR ship, and had deeper draft than an LMSR with an equivalent load. Though FastShip did maintain a faster speed than an LMSR in rough sea states, these sea states are so seldom encountered in regions where FastShip would be employed that the advantage is muted.

POLITICAL-MILITARY (POL-MIL) ANALYSIS/ARMS CONTROL

In the post-Cold War world, the tendency for conflict of some magnitude persists. These conflicts are loaded with political and military difficulties that test old alliances, our national resolve, and our preparedness for dealing with unconventional threats. CAA takes a lead role in analyzing these issues through a continuous program of workshops and wargames. CAA uses its array of computer models, some of which were developed to deal with unconventional and/or smaller-scale contingencies; and subject matter experts including retired military officers who have had first hand experience with these situations.

PATRIOT SHIELD 99 (PS99). PS99 was a major pol-mil game conducted by CAA-CA for DAMO-ODL, 2-4 Feb 99. It was the successful culminating phase in a multiphase Antiterrorism / Force Protection (AT/FP) study to develop and demonstrate an analytic method to measure and evaluate Army AT/FP conditions and report resource and operational requirements at installations. PS 99 followed a series of installation site visits with installation AT/FP committees, Sep-Oct 98; a formal AT/FP Work Group, 26 Oct 98; a major AT/FP Issues Workshop, 18-20 Nov 98; and two subsequent site visits in Dec 98 and Jan 99. Each of these events / phases served to further refine an AT/FP model designed to address the AT/FP study objectives outlined above. PS99 involved gamers from DAMO-ODL, NGB, OCAR, OACSIM, ODSINT, DAIG, 902d MI, INSCOM (LIWA), MACOMs (AMC, FORSCOM, TRADOC, MDW), Installation PMs, CID, DOMS, DA PA, MEDCOM, USA Corps of Engineers - Protective Design, CAAP, USN (CNO, J34), FEMA, DoJ, and CAA. PS99 served to evaluate the AT/FP model at installation/MACOM/DA levels, provide an assessment of the uniform installation AT/FP reporting model within an operational context, and provide a final subject matter expert evaluation of the model prior to formal DA staffing.

NAMSAM 99 Political-Military Game held 12-13 Jul in Seoul Korea, and was sponsored by USFK/ROK MND. Purpose of NAMSAN was to develop a range of candidate NEA regional chemical-biological strategies. The objectives were to:

- Refine candidate NEA regional chemical-biological nonproliferation issues

- Identify nonproliferation Confidence and Security Building Measures (CSBM) and Mutual Reassurance Measures (MRM).

- Develop alternative ROK-US strategies to optimize nonproliferation CSBM and MRM objectives.

- Evaluate role of NEA regional security organizations in CSBM and MRM compliance and verification.

Counterproliferation Defined. Complete destruction of weapons, weapon production facilities, weapon related technology, stockpiles, and delivery systems; control of dual use technology; no transfer of capabilities or technology; and no development of weapon and/or weapon specific delivery system.

Long-term objective: no country should possess any stockpiles of any kind

Key Insights:

- North Korea considers being a WMD power key to regime maintenance -- it provides them a sense of importance/international prestige and geopolitical leverage, specifically with the US (food, oil, etc.).

- China will play a role in any resolution. Reduction or loss of Chinese economic support without another party filling the void would be a crushing blow to North Korea, increasing its sense of paranoia.

- Effective CSBMs can lead to nonproliferation with full cooperation of all governments. These are political, not military, issues.

- Economic assistance must be used in conjunction with some other measures (diplomatic, political, and military). This has the potential to reduce proliferation, not prevent it.

- ROK Sunshine Policy potentially addresses the overall geopolitical concerns that can have a positive impact on reducing WMD. Short term, no utility for nonproliferation; long term, North Korea's senior leadership may use this type of initiative as a way out.

- North Korea WMD is subordinate to overall North Korea geopolitical issues. ROK Sunshine Policy has potential to indirectly influence WMD by addressing the larger geopolitical issues.

The participants in the pol-mil game were KIDA,USFK, DCSOPS, JCS, OSD, DUSA(IA), DCSINT, NGIC, AWC/SSI, NDU, DOS, DIA, DTRA, IDA, and CAA.

OPERATIONAL STRATEGY

Strategies based on existing military capabilities are operational strategies -- those that are used as a foundation for the formulation of specific plans for action in the short-range time period. Therefore, operational strategies must be based on capabilities.

The Very Rapid Deployment (VRD) study was conducted to establish the relative cost and effectiveness of different deployment options to meet the CSA's strategic vision requirements. It examined various airlift and pre-positioned equipment set options in their ability to improve deployment to a set of 42 worldwide small-scale contingencies.

Ten different options were examined, five airlift improvement options, and five pre-positioned equipment set options. Airlift improvement options were to use the current fleet, buy 50 more C-17s for the United States Air Force (USAF), buy 100 more C-17s for the USAF, subsidize the purchase of 100 MD-17s for the civil reserve aviation fleet, or subsidize a performance improvement in speed for the C-17. The pre-positioned equipment set options involved equipment sets placed in CONUS, Europe, Asia, Puerto Rico, or a combination of the aforementioned locations. Appropriate limiting costing and transportation assumptions were employed. Model output indicated the size of the force that could be deployed to an SSC within 120 hours. The results indicated that, in terms of cost effectiveness for closing a force to an SSC, pre-positioned equipment options are more effective than airlift improvement options. Given appropriate warning and well-placed pre-positioned equipment sets, one can respond to SSC missions worldwide within 5 days. The study did not attempt to judge the effectiveness of the force level with respect to mission accomplishment. Nor did the study examine the effect of end-country infrastructure.

Very Rapid Deployment by Air and Sea (VRDAAS) into SSCs was a follow-on study to VRD. As before, the Army had the mission to deploy an initial force within 96 hours consisting of an airborne brigade, and a medium brigade. In an additional 24 hours, follow-on forces should close consisting of a heavy brigade, and a second medium brigade. Our mission was to examine the cost and effectiveness of different deployment options to meet the Army's mission with additional and modified parameters. Again, 41 SSCs were employed, which formed 31 unique destinations. The pre-positioned equipment set options involved placing equipment in CONUS, Europe, Asia, and combinations of the aforementioned locations. The airlift improvement options involved either purchasing more C-17s or subsidizing the purchase of MD-17s for the civil aviation reserve fleet. A light brigade, which was approximated by one-third of the 82d Airborne Division, and a medium brigade, based on a light armor cavalry regiment equipped with wheeled

vehicles, formed the forces to be deployed by air. Appropriate air fleet availability and operational readiness rates were employed. Again, infrastructure requirements were assumed sufficient to support the deployment, and units were assumed to have received sufficient notice to begin movement on C-day. Additionally, the model examined the sensitivity of strategic lift allocation, whereas the prior study had assumed that the Army received all available strategic airlift. The study also examined deploying heavy units by sea in 120 hours. Measures of effectiveness included the cost of each option, the force level closed in 96 hours, and limiting closure factor for each course of action, cargo, or personnel. In all cases, cargo was the limiting closure factor, not personnel.

Possible Rapid Assessment and Initial Detection Sites (PRAIDS) Summary. The Directorate of Military Support (DOMS) within the Headquarters, Department of the Army (HQDA), tasked the Center for Army Analysis to analyze options for locating rapid assessment and initial detection (RAID) teams. The RAID teams, which are under the direction of the National Guard Bureau, are designed to provide assistance to civilian authorities in the event of a chemical/biological attack on a US civilian target. Sixteen RAID team sites have already been selected and will be activated by the end of FY 2000. Eleven more teams are to be activated in FYs 2001-2003. The goal of the PRAIDS project was to identify and assess station locations for these teams which would provide a response (defined as being within 150 miles of a team) that covers the largest metropolitan areas and for the greatest percent of the total US population. The analysis was driven by a request from Congress.

The results of the study were achieved through geographical analysis, chiefly through, use of Environmental Systems Research Institutes ArcView software package. Using ArcView, it was possible to quickly and efficiently determine the population totals covered for each of the potential RAID site locations. The analysis provided a list of 11 sites that, when combined with the existing 16 sites, achieved higher population totals while avoiding locating sites within 150 miles of any other RAID sites. Presently, DOMS is using the analysis from PRAIDS results in working with Congress to plan the siting of the RAID teams.

OPTIMAL USE OF RESOURCES

As we try to stretch defense dollars to cover a wider range of threats, the Army has become far more cost conscious. CAA is often asked to analyze current ways of doing business so that we can squeeze more efficiency out of declining Defense budgets. Included in the cost spectrum are environmental concerns which by law and regulation will drive up the cost of defense if neglected. Other major topics under this analysis category are the development of acquisition and investment strategies.

Modeling to Optimize Restoration Technology and Investments Phases I and II (MORTI I and MORTI II). In FY 98, the Director of Environmental Programs (DEP), Office of the Assistant Chief of Staff of the Army for Installation Management (ACSIM), requested that CAA develop and apply a methodology to aid environmental program managers in prioritizing the distribution of funds to the major Army commands (MACOMs) for environmental restoration projects. Restoration projects are broken down into phases that must occur sequentially, with each phase requiring a specific number of years to complete. Currently, there are 3,300 project phases to be scheduled over 13 years, not including restoration due to base realignment and closure (BRAC), formerly used defense sites (FUDS), Massachusetts Military Reserve, and Rocky Mountain Arsenal.

CAA developed an integer programming model to provide alternative schedules, based on different objective functions. To date, the objective functions have given priority based on risk level and on MACOM closeout. The general findings were that: 1) prioritizing on closing the high-risk sites as soon as possible reduces the number of high-risk site/phases faster, with a tradeoff in the number of site/phases started early (i.e., fewer projects start early); and 2) prioritizing on closing specific major commands as soon as possible reduces the number of site/phases faster and closes out more installations faster by starting low-cost site/phases earlier, but the tradeoff is that the number of high risk site/phases does not decrease as fast. Currently the MORTI model is being used in support of the Program Objective Management (POM) build.

PLANNING DATA/FACTOR DEVELOPMENT

Within the Army and CAA there is a constant need for current, standard planning data from which we can project future outcomes and requirements. CAA finds itself on the sending and receiving ends of this essential element of Army planning and analysis.

Joint Service Chemical Defense Equipment Consumption Rates 4 (JCHEMRATES IV). This study developed chemical defense equipment (CDE) logistic consumption rates for Northeast Asia and Southwest Asia for all four services based on the 1998-2003 Defense Planning Guidance and the J8 Weapons of Mass Destruction Study. It is an update of the JCHEMRATES III Study.

To accomplish the analysis, theater campaign simulations were conducted using the Force Evaluation Model, current chemical defense doctrine, and Defense Intelligence Agency (DIA) estimate of Red force capabilities. No Blue retaliatory attacks were conducted with chemical, nuclear, or biological weapons.

For the campaign simulations, both the quantities of the Red chemical weapons employment and the effectiveness of weapons based on weather conditions were varied. The results of the campaign simulations, i.e., casualties (both chemical and conventional), equipment losses, and proportion of contamination on units were used in a spreadsheet integration model which calculated the consumption rates and total consumption for the selected consumable CDE by service.

TOOL AND METHOD DEVELOPMENT

At the base of the CAA study program are models, methods, and other analytical tools which enable us to produce reliable and sensible answers to a new generation of complex problems and questions.

Analysis of Complex Threats (ACT). In November 1997, the ODCSOPS War Plans Division asked CAA to develop and demonstrate a methodology to forecast likely foreign country and regional instabilities that could challenge US security interests and precipitate smaller-scale deployments by the Army. The War Plans Division wanted an analytically defensible approach for supporting the development and evaluation of long-range scenarios in which the Army may be deployed to defend and support US national security interests. The ACT Study developed, demonstrated, and validated such a methodology. This methodology was also applied to countries in the US Pacific Command area of responsibility in the ACT-Pacific (ACT-PAC) QRA, sponsored by the Research and Analysis Division, HQ USCINCPAC.

The ACT Study first drew upon several prior CAA studies to identify key structural factors that affect the stability (or instability) of a country. GDP per capita, infant mortality rate, political rights index, youth bulge, and daily calorie consumption per person per day were the internal country factors used in ACT analytical models. The relationship between these factors and historical instances of country instability was explored and modeled using existing machine learning and data mining techniques and new statistical/fuzzy and temporal data mining techniques. Models were developed and tested for global, European Command (EUCOM), and Pacific Command (PACOM) data sets. For purposes of validating the models developed, country instability was reflected by "armed conflicts involving at least 25 battle-related deaths" that occurred between 1989 and 1997. The forecasting capabilities of ACT have been validated and tested for global, EUCOM, and PACOM models with good performance results over a 5-year period of time. In addition, the forecasting capabilities of ACT have been demonstrated but not yet validated for a 10-year time period.

ACT provides the Army with a credible analytical tool that supports future scenario planning and analysis. It can contribute in the identification and analysis of where challenges to US security are likely to occur for force planning purposes (e.g., mobilization and deployment planning). ACT can also be used to support preventative defense measures that might enable the US to address and possibly influence factors that could lead to country and regional instability. Specifically, combatant commanders in chief (CINCs) engaged in shaping activities aimed at promoting regional stability and preventing or reducing regional or state-centered threats could benefit from ACT analysis. For both

types of applications, ACT provides a responsive framework for conducting "what if" analysis in support of strategic planning and intelligence requirements.

Noncombatant Evacuation Operation Simulation (NEO-SIM). NEO-SIM supports planning for non-combatant evacuation operations. It was developed to meet the needs of the Southern European Task Force (SETAF) for analyzing courses of action as part of its crisis action planning process. By using NEO-SIM, analysts can determine how best to route available evacuation assets to pickup the evacuees, the approximate length of time the operation will take, and the effect additional resources will have on the duration of the operation.

NEO-SIM solves the route selection problem as a mixed integer program and then assigns routes to the available aircraft or helicopters using a simulation. After assigning the routes, the analyst uses the NEO simulation to determine the length of the operation. This simulation reflects various factors that affect operations such as the number of crews available, scheduled maintenance, airfield capacity, and the use of forward operating bases and safe havens. It is possible to modify the simulation to answer specific questions asked by the operation planners.

Stochastic Analysis of Resources for Deployments and Excursions (SARDE). SARDE was performed under the sponsorship of the War Plans Division (SSW) of the Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS). It is a follow-on effort to the Stochastic Analysis of Deployments and Excursions (SADE) Study and the development of mission task organized forces (MTOF).

Objectives include the development and demonstration of a methodology to predict the requirement for Army units, by type, needed to support simultaneous SSCs in the future. The initial results were provided to the Total Army Analysis-2007 Council of Colonels.

SARDE extended the approach used in the SADE study, which modeled the arrival of SSCs in a manner similar to the way customers are serviced by business representatives in banks, stores, etc. The US military servicing the arriving SSCs is modeled as a queuing system using computer simulation.

SARDE applies either the appropriate MTOF or appropriate historical force list to the SSC as it arrives into the queuing system and accounts for the units used to service the mission. The total quantity of each unit type used in each time period (month) is recorded. The simulation is replicated and, based on statistical analysis, a probability distribution is generated that describes the usage of each type unit.

The requirements generated by the SARDE process are then compared to requirements for units in the major theater wars (MTW) as determined in the standard Total Army Analysis methodology, and to the present composition of the Army force structure. Thus, the anticipated use of forces in future SSCs can be robustly quantified. This information can be incorporated into the overall force structure decision making process.

The SARDE methodology can be further extended to examine the usage of other resources in SSCs. These resources include personnel by military occupational specialty (MOS) and skill level, as well as equipment. Also, the risk assessment capability inherent in SARDE could provide insights into potential stress areas within the Army.

Note: the status of ongoing model developments such as ARES, GDAS, and MOBCEM are detailed in Chapter 4.

Section III. NATIONAL AND INTERNATIONAL MILITARY OPERATIONS RESEARCH ACTIVITIES

CAA engages in a host of activities involving the national and international exchange of professional information and techniques; the professional development of analysts; the promotion of research and development efforts in the field of military operations research; and the application of advanced technologies. Collectively, these efforts help maintain the expertise and essential analytical perspective important for understanding and analyzing current issues. Some of the more notable of these activities are identified in this section.

- The Fourth US/Canadian Symposium on Operations Research in August 1999 was held at CAA.
- The Fifth US/German Workshop on Operations Research was held at CAA 13-15 October 1999
- ROK-US Defense Analysis Seminar X was held in Seoul, Korea, at the Korean Institute for Defense Analysis on 25-28 October 1999.
- Japan-US OR Symposium XII (JUORS) was held in Japan, on 19-22 October 1999.
- Two US-UK Study Coordination Meetings were held at CAA, May and October 1999.
- JPACS and other ROK-related activities.
- NATO-Partnership for Peace Political-Military Gaming.
- UK and Canada Political-Military Gaming Support.

FOREIGN VISITORS AND DIGNITARIES

CAA has always participated with foreign nations in the exchange of knowledge and information in the area of military operations research. The world, situation following the end of the Cold War, however, has served to magnify the importance of these ongoing dialogues. Allied nations continue to share information because, if recent trends continue, ad hoc coalitions and alliances will be the order of the day when it comes to settling international conflicts. To that end, CAA was privileged to host the following dignitaries:

Australia:

- Dr. Roger Lough, Chief of Land Operations Division, DSTO – Electronics and Surveillance Research Laboratory.
- LTC David Rogers, Australian Liaison Officer to the Communications and Electronic Command (CECOM).
- Brigadier Gordon Jones, Military Attache, Australian Army, Embassy of Australia, Washington, D.C.
- Dr. John Leslie Riley, Defense Science Attache – Embassy of Australia, Washington, D.C.
- Dr. Ian Headly Brunskill, Senior Analyst, DSTO, Theatre Operations Branch.
- Dr. Gregory C. L. Searle, Defense Science Attache, Defense Science and Technology Organization.

Canada:

- Ms. Ann Bradfield, Director, General Operational Research, NDHQ Ottawa.
- Mr. Gilbert J. LaFond, Director, Operational Research (Joint & Land), NDHQ Ottawa.
- Mr. Paul R. Bender, Land Forces Operational Research Team Leader, NDHQ Ottawa.
- LCOL Walter L. Gorman, Research War Game Team Leader, NDHQ Ottawa.
- MAJ Richard J. Round, Research War Game Team, NDHQ Ottawa.
- Mr. Frederick W. Cameron, Operational Research Advisor, DLSC Kingston, NDHQ Ottawa.

Germany:

- LTC Hans-G Konert, Head of M&S Branch, Army Office.
- Colonel Peter Rzeczewski, Head of Conceptual Mtrs & Army Development Branch, Ministry of Defense Army Staff (FuH III 2).
- Mr. Kurt Grau, Dir, Marketing & Sales Systems Analysis Land Systems, IABG ALM.

- Dr. Peter Schirlitzki, Head of Armed Forces Analysis & Exercises Section, IABG.
- Dr. Dieter Hess, Head of Branch R&D, M&S, Foreign Mil Tech, Vulnerability & Lethality Effects , Fed Office for Defence Technology and Procurement.
- Klaus Schwierz, Head of System Planning, Daimler Chrysler Aerospace, Dornier.
- Ingo Reindl, Head of OR, M&A Br, Fed Armed Forces Office for Studies & Exercises.
- Martin Stolte, G3 M&S Branch, Army Office.
- Peter Schutz, Head of Planning & Resource Mgmt Branch, Fed Armed Forces Office for Studies & Exercises.
- Wolf-Dieter Loeser, Cdr, GE HOD, Infantry School.
- Norbert Weber, M&S Staff Officer, Ministry of Defense/Armed Forces Staff.

Korea:

- COL Kwang Dong Lee, Korean Joint Staff, C-3 Operations Division, Ministry of National Defense.
- Dr. Hwan Cheong Kim, Senior Researcher, Korean Institute for Defense Analysis.
- Dr. Bon Hak Koo, Senior Researcher, Korean Institute for Defense Analysis.
- Dr. Jong Soo Kim, Research and Development Attache, Korean Embassy.
- Dr. Dong Joon Hwang, Vice President, Korean Institute for Defense Analysis.
- Dr. Chang-Kyu Jang, President (ROKA, Retired), Korean Institute for Defense Analysis.
- Dr. Changsu Kim, Senior Researcher, Korean Institute for Defense Analysis.

United Kingdom:

- Mr. James Platt, Attache, Defense Equipment (Land), British Defense Staff, Embassy of the United Kingdom.
- Dr. Ian W. Sharpe, D Science (Land), United Kingdom.
- Mr. Christopher Morris, CDA Farnborough, United Kingdom.
- Dr. Alan M. Dixon, Deputy Director, Science (Land), Ministry of Defense, United Kingdom.
- Dr. George Cran, Senior Scientist, Centre for Defense Analyses, United Kingdom.
- Lt Col Andrew D.L. Thomas, Science (Land Directorate), Ministry of Defense, United Kingdom.
- Dr. Brigid M. E. Rodgers, CBD Porton Down, United Kingdom.
- Mr. Peter J. Starkey, Director, Scrutiny and Analysis Plans and Policy, Ministry of Defense, United Kingdom.
- Mr. Andrew D. Hossack, SSO, CDS (HLS), United Kingdom.
- Mr. Andrew J. Simonds, HSO, CDS (HLS), United Kingdom.
- Mr. Michael J. Larcombe, DSC (Land), Ministry of Defense, United Kingdom.
- Ms. Selena L. Wright, Defense Equipment (Land), British Embassy, Washington D.C.

PROFESSIONAL SOCIETIES

AORS XXXVII - 13-15 October 1998. Fort Lee, VA. The TRADOC Analysis Center sponsored this annual event. The theme for this year's symposium

was "Discovery through Operations Research." The following CAA personnel made presentations:

Presenter	Topic
Mr. Daniel Shedlowski	Revolution in Analytical Affairs (RAA-2000)
COL Andrew Loerch	A Framework for Optimizing Force Structure Resourcing
CPT Kevin Vink	WARS/Bright Star 97 (BS97)
Dr. Elizabeth Abbe	Mobility Requirement Review – End to End (MRR-N2N)
LTC Jerry Glasow	Longbow Requirements (LONGREQ)
&	Wartime Requirements FY 2005 (WARREQ-05)
LTC Patrick DuBois	Stochastic Analysis for Deployments and Excursions (SADE)
Mr. Joel Gordon	Privatizing Utilities Program (PUP)
COL Wm. Forrest Crain/ MAJ Jim McMullin	Go-to-War (GTW)
MAJ Jim McMullin/ MAJ Kurt Bodiford	Digitization in Campaign Modeling
Ms. Julianne Allison	Mobilization Capabilities Evaluation Model (MOBCEM) Update/Potential Applications
LTC Rodger Pudwill	Graphically Based Analysis System – Enhanced

67th MORS Symposium - 22-24 June 1999; hosted by the US Army Military Academy, Department of Mathematical Sciences and the Department of Systems Engineering. Fifteen papers were presented, and 14 CAA personnel accompanied Mr. Shedlowski to this annual event. The theme for this year's symposium was "Focusing Military Operations Research: From Our Heritage to the Future." The following CAA personnel made presentations:

Presenter	Topic
Dr. Elizabeth Abbe	Advances in End-to-end Mobility Modeling
Ms. Julianne Allison	Mobilization Capabilities Evaluation Model Update
COL William Crain/ Mr. Karsten Engelmann	Current Operations in Bosnia Bosnia Force Structure Analysis (Troop to Task)
Mr. Karsten Engelmann/ MAJ Rick Holdren (TRAC)	Bosnia Benchmark Assessment- Interim Update
LTC Herman J. Orgeron	Incorporating Force Structure Requirements for Smaller Scale Contingencies into the Total Army Analysis
LTC Robert Steinrauf	Deployment Burden: A Metric for Analyzing the Effects of Smaller Scale Contingencies on Force Structure
LTC Patrick DuBois	Stochastic Analysis of Resources for Deployments and Excursions (SARDE)
&	Noncombatant Evacuation Operations Simulation (NEOSIM)
Mr. Giles Mills	Army Movement Requirements

Ms. Trudy Ferguson	TAA-07 Tactical Ballistic Missile Evaluation
Mr. John Elliott	Weapons of Mass Destruction Terrorist Response Study (WMD-TRS) Workshops and Games
LTC Rodger Pudwill	Examination of RAID Team Alternatives using GBASE
Ms. Linda Coblentz	Modeling of Restoration Technology and Investments (MORTI)
MAJ James McMullin	Go-To-War
MAJ Kurt Bodiford	Digitization in Campaign Modeling

➢ ***COL Andrew Loerch*** was elected to the Board of Directors at the West Point MORS Symposium. Mr. Howard Whitley III continued participation on the Board of Directors of the Military Operations Research Society as an Advisory Board Member in CY 98/99.

PRESENTATIONS AT OUTSIDE FORUMS

Institutes for Operations Research and Management Science (INFORMS), 25-28 October 1998, Seattle, Washington.

- LTC Thomas M. Kastner presented: "Small Scale Contingency Force Planning Using Time Series Analysis."

- COL Andrew Loerch presented: "Optimization Framework to Support Resourcing Decisions in Total Army Analysis."

- LTC Patrick DuBois presented: "Stochastic Analysis for Deployments and Excursions (SADE)."

Workshop on Mining Scientific Datasets, September 9-10 1999).

- Dr. Yuan-Yuan Chen presented: "Fuzzy Analysis of Statistical Inference."

PUBLISHED ARTICLES AND REVIEWS

CAA emphasizes the importance of actively participating in the scientific advancement of operations research.

Publications in Refereed Journals

"Value Added Analysis for Army Equipment Modernization," *Naval Research Logistics*, Vol 46, No. 3, April 1999, COL Loerch, LTC(RET) Koury, LTC Maxwell.

"Incorporating Learning Curve Costs in Acquisition Strategy Optimization," *Naval Research Logistics*, Vol 46, No. 3, April 1999, COL Loerch.

"Racial Equity, the U.S. Army, Operations Research and Social Science," *Socio-Economic Planning Science* (Forthcoming), COL Loerch and Dr. Carl Harris (GMU).

"An Historical Perspective on U.S. Army Operations Research," *Military Operations Research* (Forthcoming), Dr. Carl Harris (GMU) and COL Loerch (with a note by Mr. Vandiver).

"Stochastic Analysis of Deployments and Excursions," *Military Operations Research* (Forthcoming), LTC DuBois.

"Ion-ion Upconversion Excitation of the 4f5d Configuration in $Pr:Y_3Al_5O_{12}$: Experiments and Forster-Theory Based Rate Equation Model" *Journal of Applied Physics"* September 1999, Dr. Anker and Dr. Merkle (ARL and University of Houston).

Written Critiques. Analysts had their written critiques of operations research-related publications published. The following article was reviewed by Dr. Charles Leake:

- Advances in Expert Systems for Management, Volume 2: Evaluation and Value in Knowledge-based Systems by MR Grabowski and WA Wallace(Eds)

Section IV. RECOGNITION GAINED FOR SUPERIOR WORK

The 1999 Dr. Wilbur B. Payne Memorial Award for Excellence in Analysis – group category.

Nominations:

Individual Award: Modeling of Restoration Technology and Investments (MORTI) – Ms. Linda Coblentz

Group Award: Analysis of Complex Threats (ACT)

The following individuals contributed to this excellence in analysis:

Ms. Judith Bundy
Mr. Mark Ricks
Mr. John Warren
Mr. Sun-Chan Moon
Dr. Yuan-Yuan Chen
Ms. Kumud Mathur
MAJ Paul Webber
LTC Bill Crocoli, ALMC
Dr. Robert Simmonds, ALMC
Dr. George Karypis, AHPCRC
Mr. Scott Mingledorff, NGIC
Mr. Gerry Halbert, NGIC

67 MORS Symposium - Nominated for Best Working Group Paper:

WG 6 – Go-to-War Study (COL William Crain/ MAJ James McMullin

FY 99 Study Directors' Luncheon. CAA held its annual Study Directors' Luncheon on Wednesday, 17 November 1999 to honor individuals who served as study directors for studies and other analytical efforts completed during FY 99. The guest speaker was . Dr. David S. C. Chu, Vice President, Army Research Division/Director, RAND Arroyo Center. Twenty-three individuals received recognition for completing 63 studies, QRA, Projects, or RAA during FY 99. Certificates of Achievement were awarded to 17 individuals who directed a total of 34 studies and quick reaction analyses; Certificates of Accomplishment were awarded to 20 individuals who directed a total of 29 projects and research analysis activities.

The Director's Award for Excellence. The 26th Annual Dinner Dance was held on 10 April 1999. As in past years, this event was the venue for presenting the Director's Award for Excellence. The Director hosted this annual event and presented the Director's Award for Excellence to the following individuals:

Individual Support Award:
LTC Ronnie L. Payton

Individual Analyst Awards:
LTC Stephen P. Peterson

Team Awards:

Support Team -

Mr. David A. Hurd
Mr. Charles D. Thurston
Mr. John W. Buchanan
Mr. David E. Hollenbeck
Mr. Peter V. Porrello
Mr. Russell A. Pritchard
Mr. James B. Wantland
MAJ Stanley J. Emelander
MAJ George M. Stokes
Ms. Lan X. Duoug
Mr. Raymond Finkleman
Mr. Nicholas E. Rierson
Ms. Loretta Richardson
Mr. Michael D. Senter
Ms. Gayle W. Slade

Total Army Analysis-2007 (TAA-07) Leaker Analysis Team -

Ms. Trudy A. Ferguson
Ms. Kathleen P. Le

Mr. Matthew J. Ogorzalek
MAJ Timothy L. Ockerman
Mr. James B. Wantland

Individual Performance Awards. CAA leadership recognizes excellent performance through a robust awards program which even in lean times is used to promote productivity and quality by rewarding high personal achievement. The following awards were given in recognition of past performance and concomitant gains to CAA and the US Army, now and in the future.

Military Awards

FY 99 Military Service Awards

Army Achievement Medal:	0
Army Commendation Medal:	0
Meritorious Service Medal:	4
Legion of Merit:	0

Military Retirement Awards.

Meritorious Service Medal:	1
Legion of Merit:	4
Total Military Awards:	**9**

Civilian Awards

Meritorious Civilian Service:	1
Commander's Award for Civilian Service:	10
Superior Civilian Service Award:	7
Achievement Medal for Civilian Service:	2
Quality Step Increase:	18
Performance Award:	58
Special Act Award:	3
Time Off Award	3
Total Civilian Awards:	**102**

Section V. CAA INTERNAL & MANAGEMENT SUPPORT ACTIVITIES

CAA CY 99 Military History Program. CAA maintained a vigorous Military History Program in the form of a seminar series on Joint and Combined Operations, knowledgeable guest speakers, and staff rides to historic battle sites.

Joint and Combined Operations Seminars:

Case Studies	Guest Presenter	Date
GLOCs (Patton)	Professor Alan Blum	19 Feb
ALOCs (CBI/Berlin)	Dr. Roger Miller	15 Apr
Sealift Ports/ Prepo/LOTS	Mr. William Crowder	28 Jun
Strategic Maneuver	Dr. Michael Krause	10 Sep
WW II Balkans		(TBD)
Strategic Air		(TBD)
Trouble Spots		
Fighting for the Future	Mr. Ralph Peters	30 Jul
Balkan Ghosts	Mr. Robert Kaplan	17 Aug
Black Hawk Down	Mr. Mark Bowden	27 Aug
Columbia	Mr. Michael Shifter	9 Dec
OOTW History	Mr. Eugene Visco	29 Nov

Staff Rides:

- The Chancellorsville Campaign (May 1863) – Theater Campaign Seminar (TCS) Participants

- The Fredericksburg Campaign (Dec 1862) - TCS Participants

CAA FY 99 Human Dignity Council. The Human Dignity Council establishes program and activities to recognize and bring attention to the histories, characteristics, and the accomplishment of the diverse ethnic entities and special groups that make up our nation and our organization's family. This fiscal year's activities included:

- International Day Celebration (Jan)
- Dr. M. L. King Birthday Observance (Jan)
- African American/Black History Month (Feb)

- National Women's History Month (Mar)
- Holocaust Memorial Week (Apr)
- Asian/Pacific Heritage Month (May)
- Women's Equality Day (Aug)
- Native American/Indian Heritage Month (Nov)

CAA 1999 Combined Federal Campaign (CFC). The CFC is a philanthropic organization that is an excellent means of providing financial assistance to a variety of charities. This assistance is provided through the selfless efforts of Federal employees. CAA's CFC was conducted from October through mid-December 1999. The campaign was a success, with 123.18 percent of our financial goal met and with 86.3 percent participation.

CAA FY 99 Army Emergency Relief (AER). AER is a Non-DOD sponsored Army charity, helping soldiers and families through financial problems. The AER contribution period was 13 April 1999 through 18 May 1999. A substantial contribution to the AER was made of $2,235 by soldiers, retired soldiers, and DA civilians. This year we had 22 military and 16 civilian contributors. Collections were the same as last year's donations. DA tracks dollars per soldier contribution -- we have approximately $83 per soldier, (a 59 percent increase over last year).

CAA FY 99 Picnic. The CAA annual picnic, hosted by the Conflict Analysis Center, was held Friday, July 23rd at Statesman Park. Approximately 160 people attended this annual event.

The 225th Army Birthday. CAA celebrated the US Army's 224th Birthday on 14 June 1999 with a ceremony and refreshments.

Management Planning Conferences

Management Planning Conferences are held offsite quarterly for CAA management to plan important future activities. This fiscal year's conferences were held 21 October 1998, and 13 January, 4 May, and 27 July 1999.

CAA is continuously planning for the future by finding new and better ways of doing business. The purpose of our planning meetings is to get away from the day-to-day work activities and focus on specific goals for the near-, mid-, and far-term future of the Center. In addition, each division chief briefs his/her management initiatives and major activities taking place in the near future. Major topics for FY 1999 conferences were:

- **TAA-07 - Top Challenge of FY 99.** TAA is has always been a major undertaking at CAA. TAA-07 promised to be even more so, due to a greatly expanded scope, much greater complexity, and fewer resources. The majors, issues discussed were: maintaining consistency across the various models and simulations, given the complex interactions; maintaining quality assurance, given the much larger amount of work to be performed in the allotted time; and keeping the work on schedule, given the usual problems.

- **Implementing Revolution in Analytical Affairs (RAA XXI).** Due to the significant change in demands on the analytical community, a revolution needs to take place in order to meet customer demands. Recommendations are:

  - "***Strategic Partnering***" to extend the analysis interface forward into the customer environment to interact directly with customers to ascertain and meet demands.

  - "***One Stop Shopping***" via collaborative efforts with contract/FFRDC analysts and other analytical agencies.

- **Relocation to Ft. Belvoir/Payne Hall Dedication.** The Leadership Team was continuously updated on the status of the relocation of CAA to Ft. Belvoir during Management Planning Conferences throughout 1998 and 1999. The move was scheduled for the end of March 1999 and actually took place beginning 21 March 1999. The Dr. Wilbur B. Payne Hall Dedication Ceremony took place on Friday, 28 May 1999.

- **CAA Documentation Improvement Process.** The intent of this project is to standardize CAA briefing and report formats and to, develop templates,

macros, guidance, and training to assist those preparing CAA documentation. The overall intent of the project is to be supportive of the individual analyst documentation efforts.

- **Information Technology/Modernization/Y2K.** The potential staffing shortfalls and possible consequences were discussed at length. Status reports on technological transfers from the current facility to the new building at Fort Belvoir were provided. Status of IT in the new building, and IT modernization, continue to be a major topics at these conferences.

- **SEEP Recruitment.** The recruitment program for the Student Education & Employment Program (SEEP) is a regular topic of discussion.

- **Strategic Partnerships.** Strategic partners presented assignment status, with discussion of potential new business for CAA. These partnerships have been initiated to facilitate an analytical support interface with principal supported elements in ODCSOPS, and to ensure that CAA remains in the loop on important Army issues.

- **CAA Opinion Survey.** Since the end of the Cold War, the Defense establishment, including CAA, has been asked to do more with less. To meet this challenge, we focus on meeting our customers needs, streamlining our processes, multiplying our capabilities, and involving everyone at CAA to improve our productivity and the quality of our products/services. This survey, is based on the perceptions of everyone at CAA and helps in ascertaining how far we have come, where we are, and what more we need to do.

SUMMARIES OF FY 99 CAA ANALYTICAL EFFORTS

STUDIES

Analyzing Complex Threats (ACT)

Develops and applies a methodology for identifying and analyzing potential threats to US security interests that could lead to the need for Army forces in the future. The POC for further information is Ms. Judith Bundy, the Center for Army Analysis, 703-806-5382.

Army PTD Support Analysis FY07 (APSA07)

Prototypes the Capabilities Based Munitions Requirements (CBMR) process for the SWA Halt Phase and implements the process for all phases of a SWA warfight. Under the CBMR process, Service munition requirements must be consistent with the Phased Threat Distributions (PTD) associated with the DPG IPS Two Major Theater Wars. J8 has requested Service assistance using existing Service models and data sets to determine PTDs. The POC for further information is LTC William Nanry, the Center for Army Analysis, 703-806-5639.

Antiterrorism/Force Protection Study (AT/FP)

Develops and demonstrates a methodology for assessing costs and benefits associated with standards of Army Regulation 525-13, Antiterrorism Force Protection (AT/FP): Security of Personnel, Information, and Critical Resources. The POC for further information is LTC David Knudson, the Center for Army Analysis, 703-806-5359.

Joint Service Chemical Defense Equipment Consumption Rates 4 (JCHEMRATES IV)

Develops revised Chemical Defense Equipment (CDE) consumption rates based on the current DPG force levels and arrival times for a dual MRC, near- simultaneous scenario. The POC for further information is Mr. Karsten Engelmann, the Center for Army Analysis, 703-806-5532.

OFP New and Extended (ONE)

Determines the MTOFs required not only in major theater wars MTWs) and small-scale contingencies (SSCs), but also the MTOFs required to conduct other missions, such as the base engagement force (BEF), the base generating force (BGF), consequence management, etc. The POC for further information is LTC Herman Orgeron, the Center for Army Analysis, 703-806-5682.

QUICK REACTION ANALYSES, PROJECTS, AND RESEARCH AND ANALYSIS ACTIVITIES

AMSAA Beta Test (A-BETA)

Reviews and tests draft Version 1.0 of the Joint Anti-Air Combat Effectiveness: Air Defense (J-ACE:AD) CD-ROM produced by the Artillery and Aviation Branch, AMSAA. The POC for further information is MAJ Andrew Feickert, the Center for Army Analysis, 703-806-5562.

Analysis of Complex Threats - Pacific (ACT-PAC)

Identifies and analyzes potential challenges to US security interests in the PACOM area of responsibility (AOR). The POC for further information is Ms. Judith Bundy, the Center for Army Analysis, 703-806-5382.

Analyzing Deployed Applications of PV in Theater (ADAPT)

Develops and demonstrates a methodology for identifying and analyzing the costs and benefits of using photovoltaic (PV) systems in support of the energy needs of deployed Army forces. The POC for further information is Mr. Hugh Jones, the Center for Army Analysis, 703-806-5389.

Army Digitization Office Support TAA-07 (ADOS07)

Conducts TAA-07 FASTALS excursions to determine the baseline alternative CS and CSS force structure for an alternative digitized corps in the SWA theater using

the MTW E-W base case. Produces a corps-level force structure template to be used by ADO as a force structure strawman for costing estimates of alternative digitization fielding plans. The POC for further information is MAJ Keith Wilson, the Center for Army Analysis, 703-806-5474.

Army Model Improvement Program - Mobilization (AMIP-MOB)

The Army Model and Simulation Office (AMSO) created the M&S Standards Development Process to promote reuse, commonality, interoperability, and credibility among M&S and related tools. This project is CAA support to this program. The POC for further information is Ms. Julianne Allison, the Center for Army Analysis, 703-806-5441.

APAB-PI for TAA (APAB-PITAA)

Quantifies the degradation caused to combat air bases, airports of debarkation (APOD) and seaports of debarkation (SPOD) based on calculating the number of TBMs that impact these air bases, APODs, and SPODs over the course of the campaign for two major theaters of war (MTW). Product will include model results. The POC for further information is Ms. Trudy Ferguson, the Center for Army Analysis, 703-806-5544.

APL Use Moratorium Effect on 98 OPLAN Update (APL-980P)

Analyzes the impact of Antipersonnel Land Mine (APL) Use Moratorium on the theater campaign development from USFK 1998 OPLAN. The POC for further information is Ms. Renee Carlucci, the Center for Army Analysis, 703-806-5673.

Army Dependence on Contractor Maintenance and Support (ARDOMS)

This project examines maintenance and repair contract data stored in the Federal Procurement Data System to help assess the Army's dependence on contractor support. The POC for further information is Mr. Duane Gory, the Center for Army Analysis, 703-806-5367.

Air Sensitivity Korea (ASK)

Provides sensitivity analysis on air wings available for the Denial Phase (Phase II) of the Korean Theater Campaign. Determines how many FWEs could be engaged in Kosovo without breaking the Korean Theater Campaign (Phase II). The POC for further information is Ms. Renee Carlucci, the Center for Army Analysis, 703-806-5673.

Assessment Support of RCE Alternatives - 05 (ASRA-05)

Determines if various force structure alternatives (AC/RC) can provide appropriate and sufficient forces to meet the deployment requirements for the two-MTW scenario given a posture of engagement. Secondary objectives includes determining the operating tempo (OPTEMPO), or deployment tempo, of units under the various force mixes and an estimate of the personnel tempo for selected high demand, low density specialties. The POC for further information is LTC Robert Steinrauf, the Center for Army Analysis, 703-806-5676.

ATFP Response Issues Workshop 98 (ATFP R 98)

Defines what processes/documents AR 525-13 drive; define "asymmetric threats" to understand importance of each standard; evaluates the linkages between C status ratings and standards; identifies prototype shortfalls and recommends corrective action; and outlines relationship between deterrence measures and C-ratings. The POC for further information is MAJ Gregory Barrack, the Center for Army Analysis, 703-806-5667.

Antiterrorism Force Protection Work Group 98 (ATFP WG 98)

Review AR 525-13 32 ATFP standards; identify rules for defining C status ratings; identify and use existing models as a baseline; link AR 525-13 32 ATFP standards to C status ratings; identify ATFP standard dependencies, and produce ATFP prototype. The POC for further information is MAJ Gregory Barrack, the Center for Army Analysis, 703-806-5667.

Baseline Comparison of TAA-05/07 (BaseComp-05/07)

Evaluates current campaign results to those from SRA-05, with normalized data as appropriate. The purposes for this evaluation include benchmarking results supporting SRA force structure decisions, as well as validating new CENTCOM OPLAN revisions. The POC for further information is Mr. Chester Jakowski, the Center for Army Analysis, 703-806-5645.

Bed Requirements for TAA-07 (BedReq-07)

Documents the bed requirement generation process and results by category (conventional, NBC, DNBI, TBM), time, and location. The POC for further information is COL Rebecca Mackoy, the Center for Army Analysis, 703-806-5472.

Bio Excursion Campaign Analysis - TAA07 (BioCamp-07)

Demonstrates the ability to represent effects of biological agents on theater campaign results in SWA, and provides insights about theater operations in that environment. Base case results from the chemical campaigns completed in support of SRA-07 are used for initial conditions. The POC for further information is Mr. Larry Good, the Center for Army Analysis, 703-806-5616.

Bio Threat Response Initiative (BioTRI)

Identifies roles/responsibilities of all agencies with medical response capabilities and available level of effort. Validates DOD response under Federal Response Plan. Defines/analyzes specific types and quantities of support that DOD could be asked to provide. Validates capabilities that DOD can currently support. Recommends additional equipment, training, and other resources to perform support function. The POC for further information is MAJ Gregory Barrack, the Center for Army Analysis, 703-806-5667.

Bio Threat Response Initiative Issues Workshop (BIOTRI IW)

Workshops to identify roles/responsibilities of agencies with medical response capabilities and available level of effort. Reviews DOD response under Federal Response Plan; defines specific types and quantities of support that DOD could be asked to provide; reviews capabilities that DOD can currently support. The POC for further information is MAJ Gregory Barrack, the Center for Army Analysis, 703-806-5667.

Brcko (BERCH-ko) Informatics Project (BIP)

The town of Brcko in Bosnia and Herzegovina represents an initial bellwether in the displaced persons and refugees (DPREs) process. This QRA is an analysis of the proposed DPRE process for Brcko, together with an analytical tool to assist in future DPRE activities. Product is data base and presentation/users manual. The POC for further information is Mr. Karsten Engelmann, the Center for Army Analysis, 703-806-5532.

Comparison of Chemical & No Chemical Campaigns – SRA-07 (C2NC2-SRA07)

Compares the campaigns in Southwest Asia supporting the two major theater war scenarios both with and without chemical weapons of mass destruction. Scenarios analyzed will include the primary and benchmark campaigns supporting force structure decisions driven by SRA-07. The POC for further information is MAJ James McMullin, the Center for Army Analysis, 703-806-5614.

Command and Control Protect Plan (C2P2)

Develops and demonstrates a methodology for evaluating Force XXI information system protection mechanisms, tools, devices, procedures, policies, fielding plans, and resource documents necessary to field a digitized force protected to an acceptable level of risk, ready to fight and win in the joint environment. The POC for further information is LTC David Knudson, the Center for Army Analysis, 703-806-5359.

Campaign Analysis for Chem and No-Chem Comparison-2007 (CACNC-07)

Conducts and analyzes theater campaign simulation MTW-W with and without WMD chemical effects in support of the Chief of Staff of the Army's question on impacts of chemical. The POC for further information is Dr. Dong Kim, the Center for Army Analysis, 703-806-5523.

Compendium of Aggregate-level Attrition Algorithms (CALAA)

As part of the AMSO standards development process, AMSAA, as chairman of the Attrition Standard Category Committee (SCC), requested that CAA prepare a report on our COSAGE-ATCAL-CEM theater campaign attrition process for inclusion in the planned compendium of Aggregate-level Attrition Algorithms to be published by the Attrition SCC. The POC for further information is Mr. Gerald Cooper, the Center for Army Analysis, 703-806-5305.

Casualty Counts for TAA-07 (CasCount-07)

Documents the casualty generation process and results by casualty category (conventional, NBC, DNBI, TBM), time, personnel type (Army, contractor, NEO, KSC, Katusa, EPW), and location. The POC for further information is COL Rebecca Mackoy, the Center for Army Analysis, 703-806-5472.

Campaign Analysis for SRA-07 (CASRA-07)

Conducts and analyzes theater simulation in support of developing the Army's support force requirements to successfully conduct the NMS and DPG's IPSs in a Near Simultaneous major theater war in FY 07. The POC for further information is Mr. John DePalma, the Center for Army Analysis, 703-806-5620.

Campaign Concept Analysis (E/W) (CCA)

Addresses the development of OPLAN, Korea as the second of two major regional conflicts. The analysis assists USFK planners in developing a concept of operations for the CFC warfight and assesses the impact of a different time-phased force development schedule and task organization on the campaign. This study complements the development of the current Draft Campaign Concept which will become the new OPLAN in near future. The POC for further information is LTC Thomas Kastner, the Center for Army Analysis, 703-806-5592.

Chemical Casualty Integration Analysis (CCIA)

Explores the possible methodologies of integrating chemical casualties with conventional casualties; identifies the issues, both of policy and methodology; develops a means for their integration. Obtains the approval of responsible parties, in particular the Casualty Estimation Steering Committee (CESC); and identifies the direct (or first order) effects/ impacts on medical, mortuary affairs and replacement force structure. The POC for further information is COL Rebecca Mackoy, the Center for Army Analysis, 703-806-5472.

Chemical Effects on Theater Operational Logistics (CETOL)

Participation in the Study Advisory Group for LIA's study of chemical effects upon future theater operational logistics. The POC for further information is LTC Richard Kearney, the Center for Army Analysis, 703-806-5478.

SWA Campaign Analysis for SRA-07 (ChemCamp-07)

Evaluates the differences between major theater war (MTW) scenarios in SWA attributable to threat use of chemical weapons of mass destruction. Scenarios analyzed will be limited to those primary scenarios used for force structure decisions based on the SRA-07 study. Overall SRA-07 study objectives include building/tailoring force structure to meet requirements suggested by campaign simulation results. The POC for further information is LTC William Nanry, the Center for Army Analysis, 703-806-5639.

Support to TAA-07 SWA with Reduced Warning (CHEMWINT07)

Provides chemwint report for TAA-07 SWA campaign with reduced warning with and without chemical employment. The POC for further information is MAJ Bonita Harris, the Center for Army Analysis, 703-806-5559.

Conventional Campaign for Support Requirements Analysis-2007 (Convent-07)

Evaluates the differences between major theater war scenarios attributable to changes in forces apportioned to Southwest Asia and their deployment timing. Scenarios analyzed serve as the benchmark for comparing follow-on excursions completed as part of SRA-07. The POC for further information is Ms. Rosie Brown, the Center for Army Analysis, 703-806-5595.

COSAGE - SWA Current Year (COSSWA99)

Develops set of COSAGE samples for a 99 time-frame SWA scenario. The POC for further information is MAJ James McMullin, the Center for Army Analysis, 703-806-5614.

Chief of Staff of the Army Special Project - NEA (CSASP-NEA)

Provides campaign analysis for medium weight force. The POC for further information is Mr. John DePalma, the Center for Army Analysis, 703-806-5620.

Chief of Staff of the Army Special Project - SWA (CSASP-SWA)

Provides campaign analysis for medium weight force. The POC for further information is LTC William Nanry, the Center for Army Analysis, 703-806-5639.

Analytical Support to the Chief of Staff, US Army (CSASPT)

This effort examines the use of medium forces in smaller-scale contingencies with respect to mission and task effectiveness and requirements. The POC for further information is LTC Robert Steinrauf, the Center for Army Analysis, 703-806-5676.

Analytical Support to the Chief of Staff, US Army, Support Force Impacts (CSASPT-LD)

This effort provides analytical support in analyzing the force structure impacts of a suite of Force Structure Alternatives being proposed by the CSA's initiative group. The POC for further information is LTC Stephen Peterson, the Center for Army Analysis, 703-806-5491.

Digitization Exercise System Performance Analysis (DIGEX SPA)

Performs analysis of the CTSF's system performance data, for the major digitized systems used, from the NTC to address system stability and reliability during field usage. The POC for further information is Ms. Patricia Murphy, the Center for Army Analysis, 703-806-5481.

Estimation of Potential Army Contractor Casualties (EPACC)

Estimates combat support/combat service support (CS/CSS) casualty rates that could potentially occur in two major theater wars (MTWs). Applies rates to proposed initiative to privatize selected CS/CSS units. The POC for further information is Mr. Kevin Tomich, the Center for Army Analysis, 703-806-5385.

Force Modernization Strategies (FORMOST)

Develops and demonstrates a methodology to generate and evaluate procurement, modernization, and sustainment strategies to maintain the current (FY 2000) average age for a set of aviation, ground vehicles, tactical vehicles, and engineer/construction systems (Case I, Full Modernization). Once developed, extended the study to include the procurement of the same or the next least modernized type of system the Army currently plans to produce (Case II, Mini-mod). Extended Case II to include Force Package I selected missile systems and explore the budgetary impact of other systems in general (Case III). The POC for further information is LTC William Tarantino, the Center for Army Analysis, 703-806-5446.

FROKA Sector Analysis (FSA-98)

Evaluates the effectiveness and impact of differing defensive concepts for the FROKA sector. Analysis is in support of finalizing the OPLAN from the Draft Campaign Concept (DCC). Deputy CINC specifically requested CAA assess protection provided by fortifications and determine if model accurately reflects this protection. The POC for further information is Ms. Renee Carlucci, the Center for Army Analysis, 703-806-5673.

FastShip Atlantic NDF Proposal: Quick Reaction Analysis (FSQRA)

Analyzes deployment on 40-knot ship. Researched facts from FastShip, Inc, Military Sealift Command, TRANSCOM, and DCSLOG. Compares the proposed ship against existing LMSR vessel. The POC for further information is LTC Michael Woodgerd, the Center for Army Analysis, 703-806-5438.

Homeland Defense Initiative Response 99 Issues Workshop (HDI R 99 IW)

Develops HD strategy for deterring and countering potential threats; examines DA HD roles and responsibilities and its interfaces w/DOD, JS, and other Federal agencies; refines HD force's mission, operational tasks, force capability requirements; examines revisions to UCP and Army Title X responsibilities in terms of HD; outlines strategic plan for responding to HD threat and vulnerabilities. The POC for further information is Mr. Gregory Andreozzi, the Center for Army Analysis, 703-806-5665.

Implementing - Pollution Abatement and Prevention Analysis (I-PAPA II)

Expands the scope of the I-PAPA Model to account for AMC industrial activities and to expand the computer user features of I-PAPA in general. The POC for further information is Dr. Robert Schwabauer, the Center for Army Analysis, 703-806-5356.

Installation Capabilities and Resources (INCAPR)

Investigates the feasibility of developing an analytic tool that models Army installation activities enabling analysis of issues such as base closures, mobilization and deployment, training, and AC/RC force mix. This tool is used to assess impact of policy and program decisions on installation functions which affect Army power projection capabilities. The POC for further information is Dr. Robert Schwabauer, the Center for Army Analysis, 703-806-5356.

Javelin Requirements (JAVREQ)

Reviews Javelin requirements given issues raised by OSD (PAE) review. The POC for further information is LTC David Knudson, the Center for Army Analysis, 703-806-5359.

Joint Pacific Arms Control Study (JPACS)

JPACs objectives were to identify mid- and long-term chem-bio threats in NEA, and assess impacts to ROK and Japan. Analysis assesses Chemical Warfare Convention's utility to chem-bio counterproliferation; develops alternatives to counterproliferation; assesses alternative regional arrangements to counterproliferation; and examines alternative OPLAN enhancements to cope with chem-bio threats. The POC for further information is Mr. John Elliott, the Center for Army Analysis, 703-806-5497.

Joint Warfare Analysis System Development (JWARS)

CAA furnished one person to participate, for 1 year, on the development team for the Joint Warfare Analysis System (JWARS). This project is part of a larger program, the Joint Analytic Model Improvement Program (JAMIP) lead by OSD (PA&E), and supported by J-8. The POC for further information is Mr. Wallace Chandler, the Center for Army Analysis, 703-806-5405.

Joint Warfare Analysis System Development (JWARS DS)

As the Army's contribution to the JWARS Development program, a CAA analyst served full-time in the JWARS office and participated in JWARS development activities as specified by the Director, JWARS Development Office. Weekly reports of activities were provided to the Chief, OS Division, who met regularly with the analyst to review activities and progress. The POC for further information is Dr. Charles Leake, the Center for Army Analysis, 703-806-5322.

JWARS Land Warfare IPT Support (Part 1) (JWARS-1)

Obtain VIC data and revise for use in the JWARS ground combat modeling (direct fire and indirect fire), and make recommendations on modifying simulation algorithms to meet JWARS goals. The POC for further information is LTC Herman Orgeron, the Center for Army Analysis, 703-806-5682.

Joint Warfare System (JWARS) Alpha Test (JWARS-AT)

Conducts an alpha test of Version 0.5 of the Joint Warfare System (JWARS) and report findings to the test director. The POC for further information is Dr. Ralph Johnson, the Center for Army Analysis, 703-806-5326.

MEADS Cost-Share Analysis Phase I (MEADS-CSA-I)

Conducts a preliminary analysis of equitable BMDO/Army cost share percentages for the MEADS program. The analysis, which is based on threat apportionment as well as the type and frequency of employment, may be used as a possible starting point for a BMDO/Army cost share negotiation. The POC for further information is Ms. Trudy Ferguson, the Center for Army Analysis, 703-806-5544.

MEADS Cost-Share Analysis Phase II (MEADS-CSA-II)

Examines the impact of using SHORAD force structure as a bill payer for the MEADS program. The analysis uses decision tree logic to examine the sensitivity of an integrated defense against air breathing threats (ABTs) to various levels of SHORAD. The POC for further information is Ms. Trudy Ferguson, the Center for Army Analysis, 703-806-5544.

Medium Extended Air Defense System Campaign Support Assessment (MECASA)

Assesses the suitability of performing theater-level campaign analysis at CAA to show the mission need for MEADS against the specified threat in the 2010 timeframe. The POC for further information is Ms. Pamela Roberts, the Center for Army Analysis, 703-806-5537.

Modernization Impacts of Strategic Responsiveness Options (MISRO)

Supports modernization impact analysis on the different Strategic Responsiveness Options. The POC for further information is LTC William Tarantino, the Center for Army Analysis, 703-806-5446.

Modeling of Restoration Technology and Investments (MORTI)

Assisted in prioritizing the allocation of funds for environmental restoration. CAA developed an optimization model to do this. The POC for further information is Ms. Linda Coblentz, the Center for Army Analysis, 703-806-5364.

Modeling to Optimize Restoration Tech and Investments - II (MORTI-II)

Assisted in prioritizing the allocation of funds for environmental restoration in support of the FY 02-07 POM build. To do this, CAA modified and applied the MORTI model. The POC for further information is Ms. Linda Coblentz, the Center for Army Analysis, 703-806-5364.

OFP New and Extended (MTOF01)

Determines the MTOFs required not only in major theater wars and small-scale contingencies (SSCs), but also the MTOFs required to conduct other missions, such as the base engagement force (BEF), the base generating force (BGF), consequence management, etc. The POC for further information is LTC Herman Orgeron, the Center for Army Analysis, 703-806-5682.

Joint Pacific Arms Control Study Phase III -Chem-Bio Nonproliferation IW (NAMSAN 99)

Develops a range of candidate NEA regional chemical-biological nonproliferation issues. Identifies Confidence and Security Building Measures (CSBM) and Mutual Reassurance Measures (MRM). Develops alternative ROK-US strategies to optimize CSBM and MRM objectives. Forecasts the impact of CSBM and MRM on regional and hemispheric security. Evaluates role of NEA regional security organizations in CSBM and MRM compliance and verification. The POC for further information is Mr. Robert Barrett, the Center for Army Analysis, 703-806-5652.

NAMSAN Issues Workshop (NAMSAN IW)

This QRA develops Northeast Asia regional chemical-biological nonproliferation issues with focus on CSBM and MRM and their impact on future and hemispheric security environments. It evaluates role of Northeast Asia regional security organizations in CSBM and MRM compliance and verification. The POC for further information is MAJ Howard Hall, the Center for Army Analysis, 703-806-5668.

NAMSAN Working Groups (NAMSAN WGs)

This QRA identifies a range of candidate Northeast Asia regional chemical-biological nonproliferation issues to carry forward to the NAMSAN Issues Workshop. The POC for further information is MAJ Howard Hall, the Center for Army Analysis, 703-806-5668.

Noncombatant Evacuation Operation - Simulation Model (NEO-SIM)

Develops and demonstrates a simulation model that will simulate the key events performed during noncombatant evacuation operation (NEO) in the European Command (EUCOM). The POC for further information is LTC Robert Steinrauf, the Center for Army Analysis, 703-806-5676.

OFP Generated Force Lists for inclusion in FLOW, Move 1 (OFP-FLOW1)

Provides Army trooplists for the scenarios to be used in the Focused Logistics Wargame. In some cases, there is overlap between the Dynamic Commitment scenarios and the MTOF products that have been developed to date. If there is a great similarity, we provided existing MTOFs. Where differences exist in similar scenarios, these are identified, as well as the subsequent force structure deltas. The POC for further information is Ms. Patricia Murphy, the Center for Army Analysis, 703-806-5481.

Objective Force Planning-Post-Hostilities for Two MTWs (OFP-MTWPH1&2)

Determines the potential requirements for the Army to meet its projected objectives and missions for the post-hostilities phase(s) of the 2MTW campaign developed in the OFP New and Extended (ONE) effort. The POC for further information is LTC Herman Orgeron, the Center for Army Analysis, 703-806-5682.

Patriot Leaker Analysis 99 (PA99)

Analysis uses OPLAN TBM defense plan to determine the effectiveness of the Patriot system (8, 6, and 4 launchers) against TBM attacks and produces a lookup table specifying the expected number of leakers against raid sizes 3, 6, 9, 12, 15, and 18. The POC for further information is Ms. Trudy Ferguson, the Center for Army Analysis, 703-806-5544.

Purpose of Environmental Policy and Program Requirements (PEPPR)

Provides ongoing analytical support to development of an environmental decision support system (DSS) within the structure of the DECSIM Environmental Security Corporate Reporting Suite/Corporate Reporting Module (CRM). Doing so as a contributing member of a Tiger Team comprised of various members of the Army and DOD environmental communities. The POC for further information is Mr. Kevin Tomich, the Center for Army Analysis, 703-806-5385.

Posture of Engagement-Impact on Two Major Theater Wars (POE-2MTW)

Determines the impact of posture of engagement of US Army force versus the Defense Planning Guidance requirements for two major theater wars (2MTWs). Specifically, the impact of additional smaller-scale contingency operations on the ability of the Army to meet its force requirements for 2MTWs. The POC for further information is Ms. Patricia Murphy, the Center for Army Analysis, 703-806-5481.

POM Movement Requirements 2005 (POMMR)

Develops a time-phased force deployment package of the movement requirements for the GOSC approved TAA-05 resourced force for MTWNS (E/W) scenario. The POC for further information is Mr. Giles Mills III, the Center for Army Analysis, 703-806-5447.

POM Movement Requirements 2005 Challenging POE (POMMR-CP)

Develops time-phased force deployment package of the movement requirements for GOSC approved TAA-05 resourced force for MTWNS (E/W) scenario and MTWNS (W/E) scenario with units involved in single scenario contingencies as listed in the Defense Planning Guidance (DPG) under Moderate Postures of Engagement (POE). The POC for further information is Mr. Giles Mills III, the Center for Army Analysis, 703-806-5447.

POM Movement Requirements 2005 DPG Mix (POMMR-DPG)

Develops time-phased force deployment package of the Army movement requirements for GOSC approved TAA-05 resourced force for MTWNS (E/W) scenario with the combat force mix listed in the Defense Planning Guidance (DPG) 2005. This QRA is in support of the Mobility Requirements Study-2005 (MRS-05). The POC for further information is Mr. Giles Mills III, the Center for Army Analysis, 703-806-5447.

POM Movement Requirements 2005 Moderate POE (POMMR-MP)

Develops time-phased force deployment package of the movement requirements for GOSC approved TAA-05 resourced force for MTWNS (E/W) scenario and MTWNS (W/E) scenario with units involved in single scenario contingencies as listed in the Defense Planning Guidance (DPG) under Moderate Postures of Engagement (POE). The POC for further information is Mr. Giles Mills III, the Center for Army Analysis, 703-806-5447.

Potential Rapid Assessment and Initial Detection Sitings (PRAIDS)

Evaluates alternative lists of cities for potential rapid assessment and initial detection (RAID) team placement that provide the greatest population coverage within a 150-mile radius of each site. The POC for further information is Mr. Mark Ricks, the Center for Army Analysis, 703-806-5383.

PATRIOT SHIELD 98 Political-Military Game (PS 99)

Identifies defensive measures that need to be implemented; evaluates relative weights for each standard; identifies and prioritizes ATFP requirements; and identifies requirement shortfalls and recommend corrective actions. The POC for further information is MAJ Gregory Barrack, the Center for Army Analysis, 703-806-5667.

PETRI 99 (PT 99)

Reviews NATO standardization issues; defines NATO-PfP operational procedures for managing medical biological casualty response and consequence capabilities; assesses necessary technical and tactical specifications for equipment; develops follow-on actions needed to support development of the NATO-PfP medical biological response requirements and capabilities out to 2004. The POC for further information is Mr. Robert Barrett, the Center for Army Analysis, 703-806-5652.

PYONG-HWA 99 (PYONG-HWA 99)

Supports ROK-US CFC conduct of PYONG-HWA 99 seminars. The POC for further information is MAJ Howard Hall, the Center for Army Analysis, 703-806-5668.

RCTIFYRS Extended to Include Range Throughput (RCTIFYRS-ER)

DAMO-TR is developing a system to manage the allocation of units to training locations. This study updates and extends the existing RCTIFYRS model to meet the goals of DAMO-TR. The POC for further information is Mr. Steven Siegel, the Center for Army Analysis, 703-806-5289.

Replacement Needs for TAA-07 (RepNeed-07)

Documents the replacement generation process and results by replacement category (conventional, NBC, DNBI, TBM), time, and location. The POC for further information is Mr. Stanley Miller, the Center for Army Analysis, 703-806-5475.

Stochastic Analysis for Deployments and Excursions II (SADE II)

Modifies the existing SADE model by changing the mission types according to SSW desires; reruns the model and forecasts the number of joint contingency operations by type that the US military could be involved in from 1998 to 2006. The POC for further information is LTC Herman Orgeron, the Center for Army Analysis, 703-806-5682.

Stochastic Analysis of Resources for Deployments and Excursions (SARDE)

Develops and demonstrates a stochastic methodology that forecasts the number of each type of standard requirements code (SRC) by risk level that the US military will require to service SSC operations during

the mid-range planning period, 1998-2006. The POC for further information is LTC Herman Orgeron, the Center for Army Analysis, 703-806-5682.

Systems Characteristics Acquisition Process Action Team (SCAPAT)

Conducted a thorough review of the process, from the time discussions on scenarios begin in the Intel Community until model-ready data is provided to COSAGE users, to determine what improvements can be made that will reduce the time and resources required to support theater campaigns. Collect data during the TAA-07 study cycle to use as a basis for assessing future improvements. The POC for further information is Mr. Howard Whitley III, the Center for Army Analysis, 703-806-5573.

Strategic Implications of the Massachusetts Military Reservation (SIMMR)

Analyzes the strategic implications for the Army as a whole emanating from the EPA order suspending training at Camp Edwards Army National Guard Training Center, due to concerns of contamination of the local aquifer. Of particular interest are effects on Army training and mission execution. The POC for further information is Mr. Duane Gory, the Center for Army Analysis, 703-806-5367.

Streamlining Management of Historic Properties (SMOHP)

Assesses the potential impact of implementing the proposed Army Counterpart Regulation for carrying out Section 106 of the National Historic Preservation (NHPA) and 36 CFR Part 800 which, respectively, mandate and implement an extensive multi-agency and stakeholder review and approval process for all Army actions that affect historic buildings or archeological sites. The POC for further information is Mr. Mark Clements, the Center for Army Analysis, 703-806-5370.

Specified Non-Doctrinal Adjustments to Ammunition and Fuel (SNAFU)

Conducted TAA-05 FASTALS excursions to determine the impact on CSS structure and workload requirements when adjustments are made to doctrinal fuel and ammunition stockage levels and throughputs for MTW scenarios. The POC for further information is MAJ Keith Wilson, the Center for Army Analysis, 703-806-5474.

Support to Joint Studies and Analysis (SPT J8)

The J-8 has initiated a Joint Interdiction Study in response to requirements in the Defense Planning Guidance. DAMO-SSP requested analytic support to analyze alternative joint interdiction operational concepts. Analysts work in conjunction with the Joint Staff and others primarily in meetings and reviews. The POC for further information is LTC Robert Steinrauf, the Center for Army Analysis, 703-806-5676.

SRA 2007 Base Case Deployment Analysis - Chemicals (SRA-07 BC/DA-CH)

Identifies the degradation effect on the deployment when weapons of mass destruction (WMD) are used by the enemy on the air/seaports of debarkation. The results of the analysis provide the critical force closure data to the campaign analysis phase that will affect the concepts of operation for the base case scenarios. The POC for further information is Ms. Margaret Loudin, the Center for Army Analysis, 703-806-5439.

SRA FY 2007 Base Case Deployment Analysis-No Chemicals (SRA-07 BC/DA-NC)

Conducts the initial strategic mobility analyses based on the Major theater war - Near Simultaneous (MTW-NS) (East then West) and (West then East) scenarios of FY 2000-2005 Defense Planning Guidance Illustrative Planning Scenarios. The results of these analyses provide critical force closure data to the campaign analysis phase that will affect the concepts of operation for these base case scenarios. The POC for further information is Ms. Margaret Loudin, the Center for Army Analysis, 703-806-5439.

SRA 2007 Deployment Analysis - Postures of Engagement (SRA-07 DA-POE)

Examines the effect on the deployment delivery profile for a near- simultaneous major theater war (MTW) when Army units are engaged in a preexisting small-scale contingency (SSC). The POC for further information is Ms. Margaret Loudin, the Center for Army Analysis, 703-806-5439.

SRA 2007 Deployment Analysis - Transload Operations (SRA-07 DA-TO)

Examines the effect on the deployment delivery profile for a near-simultaneous major theater war (MTW) utilizing policy for employment of organic and civil strategic lift (air and sea) when operating under a chemical/biological threat. The POC for further information is Ms. Margaret Loudin, the Center for Army Analysis, 703-806-5439.

SRA-07 Relook Deployment Analysis (SRA-07 RDA)

Develops Army movement requirements for MTW East then West scenario using doctrinal support forces generated with TAA-07 allocation rules. Compares this force in terms of magnitude and time-phasing to the original base case force for TAA-07. Performs a deployment analysis utilizing this force and compares results to original deployment for TAA-07, evaluating the differences between the two deployments. The POC for further information is Ms. Margaret Loudin, the Center for Army Analysis, 703-806-5439.

SKILLTEMPO Assessment (STA)

Attempts to determine if there are more informative measures to report SKILLTEMPO to the senior Army leadership. In addition, the analysis explores deployments by category and model deployments and examines the interrelationships between deployments of various military occupation specialties. The POC for further information is Dr. Yuan-Yan Chen, the Center for Army Analysis, 703-806-5675.

Strategic Modernization Strategies (STRATMODS)

Develops and assesses alternative modernization strategies that support alternative future force structures. The POC for further information is LTC William Tarantino, the Center for Army Analysis, 703-806-5446.

Support for Modernization Risk Assessment (SUMRA)

Evaluates what long-range impact the current Program Objective Memorandum (POM) will have on the age of the Army's fleet of essential combat and combat support systems and determines if the distribution of equipment to Active and Reserve forces will be sufficient to maintain necessary equipment readiness (inventory) levels. The POC for further information is Ms. Linda LaBarbera, the Center for Army Analysis, 703-806-5362.

SWA Support Requirements Analysis - 05 (SWA SRA-05)

The Defense Planning Guidance Near Simultaneous Major Regional Contingency (NS MRC) scenario envisions two nearly simultaneous conflicts. Two versions of the scenario differ on the sequence in which the conflicts occur. In both versions, Iraq initiates an armed conflict in Southwest Asia with the objective of seizing control of Kuwait as the 19th province of Iraq. This project provides detailed information on the campaign in MRC-E. The POC for further information is LTC William Nanry, the Center for Army Analysis, 703-806-5639.

TBM Leakage for MTW-E Using EADSIM (TAA-TBM/E)

Determines tactical ballistic missile (TBM) leakage for the MTW-E IPS scenarios. Leakages are determined by critical asset, by threat and warhead type, and by day. The POC for further information is Ms. Trudy Ferguson, the Center for Army Analysis, 703-806-5544.

TBM Leakage for MTW-W Using EADSIM (TAA-TBM/W)

Determines tactical ballistic missile (TBM) leakage for the MTW-W IPS scenarios. Leakages are determined by critical asset, by threat and warhead type, and by day. The POC for further information is Ms. Trudy Ferguson, the Center for Army Analysis, 703-806-5544.

WMD Warfare in Total Army Analysis - 2007 (TAA-WMD)

Determines the scope, level, and concept of WMD employment in TAA-07 MTW campaigns. Models effects of WMD employment in TAA-07 scenarios. Measures the effects of WMD on campaign outcomes, logistics, and casualties. The POC for further information is Mr. Karsten Engelmann, the Center for Army Analysis, 703-806-5532.

TAA-07 Foreign Intelligence Preparation (TAA07FIP)

Establishes the account for administrative functions required in the preparation of foreign intelligence for TAA-07. Includes coordination with ODCSINT, DIA DoDFIP and NGIC regarding development and acquisition of the DPG IPS subsequent taskings for scenario and technical data required by CAA to perform TAA-07. The POC for further information is MAJ Timothy Ockerman, the Center for Army Analysis, 703-806-5408.

TF HAWK Deployment Methodology Analysis (TF HAWK)

Using the deployment of the TF Hawk to Albania as an example, outlines a quick reaction real-world analysis. The POC for further information is LTC Michael Woodgerd, the Center for Army Analysis, 703-806-5438.

Training Land Requirements (TRAILR)

Installation commanders at Forts Bragg, Irwin, Schofield Barracks, Bliss, and Polk have determined that shortfalls exist in available training land to meet tenant unit training requirements. They have requested funding to purchase additional acreage to reduce shortfalls. This project is an analysis to determine the need for the additional land to support unit training requirements at the five installations. The POC for further information is Ms. Linda Coblentz, the Center for Army Analysis, 703-806-5364.

TDA Requirements Calculations and Manpower Analysis (TRCMAN)

Provides ongoing support and advice to the sponsor for improving the analytical foundations, tools, and calculation methods/conventions for identifying and assessing TDA requirements in the Army. The POC for further information is Mr. Kevin Tomich, the Center for Army Analysis, 703-806-5385.

US/Canadian Operational Research Symposium (US-CA ORS)

Provides support to the DUSA(OR) in hosting the fourth US/Canadian Operations Research Symposium, 24-26 August 1999, at the Center for Army Analysis, Payne Hall, Fort Belvior, VA. The POC for further information is Mr. Robert Barrett, the Center for Army Analysis, 703-806-5652.

VAA: Crusader and RAH-66 AND FSCS Evaluations (VAA: CARAFE)

Performs a Value Added Analysis to determine at which levels the Crusader, Comanche, and FSCS in the POM could be procured. The POC for further information is Ms. Linda LaBarbera, the Center for Army Analysis, 703-806-5362.

Very Rapid Deployment (VRD)

Explores the constraints faced by an SSC type medium weight force and develops a framework for high-level analysis and DA discussion. Scope of analysis includes identification of lift assets, likely scenarios, force projection capability, and possible deployment packages. The POC for further information is LTC Keith Solveson, the Center for Army Analysis, 703-806-5451.

Very Rapid Deployment by Air and Sea (VRDAAS)

Examines possibility of deploying forces to the SSC scenarios within 96- and 120-hour timeframes. Explores sensitivity of airlift availability, in-country infrastructure, prepositioned equipment, and sealift in satisfying deployment requirements. The POC for further information is LTC Keith Solveson, the Center for Army Analysis, 703-806-5451.

TECHNOLOGY RESEARCH AND ANALYSIS SUPPORT

TECHNOLOGY RESEARCH

General. The Advanced Research Projects Office (ARPO) has a threefold mission: to identify and evaluate advanced technologies and methodologies for potential applicability to the CAA mission; to provide consultation on advanced technology subjects and methods; and to develop and execute an applied research program. A variety of exploratory and developmental efforts to apply new and emerging technology to CAA study and analysis processes were pursued during FY 99.

Combat Simulation Trajectory Management. Dr. Gilmer (Wilkes University) continued research on the applicability of multitrajectory simulation techniques to force-on-force combat simulations. Multitrajectory simulation follows two or more outcomes of a random event, instead of only a single outcome determined by chance as is the usual practice. Gilmer's method follows and preserves many trajectories or paths and their associated probabilities through the simulation state space. One of the goals is to define and generate sets of path basis objects that span path space in a way that supports expression of new paths (such as may occur for the hundreds to thousands of brigade-level engagements in a theater campaign) as functions of the basis objects. Dr. Gilmer's self-built tool kit includes object classes which may permit model builders to add multitrajectory techniques to ordinary object-oriented simulations.

Applicability of Primal-Dual Formalism to Combat Simulation. Dr. Robinson (University of Wisconsin - Madison) continued work to adapt and extend his research on combining the best of simulation and mathematical optimization in order to add marginal values to model decision processes. He examined standard importance values within the CAA attrition calibration (ATCAL) algorithm that determines fire allocation and attrition to combat targets. Although importance values work well most of the time, technically, they are not dual variables. Dr. Robinson's ongoing research seeks measures, which are duals and work accurately, and efficiently, all of the time.

Attrition Calibration (ATCAL) Representation of Area Fire. In FY 97, research began on the representation of area fire attrition in ATCAL, a methodology for extending the results of high-resolution combat samples to the thousands of combat engagements that arise in the simulation of theater campaigns in models such as the Concepts Evaluation Model (CEM). Campaign analysts had noted that added artillery was not always exploited as intended. An important step in the methodology, the calculation of weapon importances, is central to the determination of ammunition expenditures and the allocation of fire among targets. Various analysts had noted occurrences of "inflated" weapon importances. Early in FY 99, the importance definition itself was found to be non-scalable. The rest of FY 99 was devoted to development, implementation, and test of new, scalable importances in the ATCAL algorithm and examination of their subsequent effect in theater campaign simulation runs. Subject to continued tests, the new importance methodology is expected to become part of the standard theater campaign simulation process.

Compendium of Aggregated Attrition Methods. In support of the Army Model and Simulation Office (AMSO) effort to establish common methodologies and standard algorithms for M&S functional processes, ARPO provided a chapter on the CAA theater campaign simulation attrition process, as represented by the COSAGE-ATCAL-CEM model suite, for inclusion in the proposed Compendium of Aggregated Attrition Algorithms and Methods to be published in FY 00.

High Performance Computing. Dr. Kosmo Tatalias continued his assignment as the Army High Performance Computing Research Center (AHPCRC) onsite representative. His involvement in a variety of modeling and computing initiatives

included careful study of the details of research on the ATCAL representation of target importance and related issues, and investigation of data mining techniques in support of the Analysis of Complex Threats study.

Visualization. Mr. Cooper continued to expand in-house computer visualization capabilities with emphasis on helping analysts see and understand simulation results. Throughout FY 99, he worked with selected CAA action teams to design, develop, implement, and maintain useful static and dynamic display routines. Wolfram Research's Mathematica, Version 4.0, became a power tool of choice.

METHODOLOGY RESEARCH

General. CAA uses a wide variety of simulations, models, and special purpose information technology systems to accomplish its study program. These tools, often referred to collectively as models, range from simple spreadsheets and data processing systems to complex simulations of theater combat. The following paragraphs describe major accomplishments in our continuing program of methodology development and enhancement.

Development Efforts -

Campaign Information Operations Model (CAMIO). This regional theater campaign simulation model (formerly known as the Advanced Regional Exploratory System (ARES)) continues work begun initially under the Concurrent Theater-level Simulation (CTLS) development program. Specifically, CAMIO has evolved as a merger of the CAA-developed CTLS and the Theater Exploitation Study System (TESS) model developed for the US Army INSCOM, Land Information Warfare Activity (LIWA). The model design provides an event-sequenced, object-oriented structure with the capability to represent regional conflicts in a combined, joint, and coalition context, ranging from full-scale theater operations to lesser regional contingencies. CAMIO brings together the intelligence, communications, and information warfare simulation features of TESS with the flexible regional campaign representation capability of CTLS. This flexibility is realized through a user-specified maneuver network which allows adaptable representation of maneuver warfare and a robust command and control process, with both user-scripted and rule-based decisions, which permits user control of the phased execution of an operation plan, all controlled through an extensive graphical user interface (GUI). The information operations representation is based on the existence of an individual and current "battlefield perception" maintained for every unit and action entity in the simulation. The design work for the then ARES began in late FY 95, with the objective of producing a first prototype version by mid-FY 97. This objective was achieved in September 1997 with the installation of the initial operational capability (IOC) version of the model. Since that time, the emphasis has been on acceptance testing, debugging, and additional functional upgrades, such as a major enhancement to the fire support representation. That process produced 10 upgraded model versions in FY 98 and FY 99, with decreasing frequency due to funding constraints. Assured funding ceased at the end of FY 99.

Global Deployment Analysis System (GDAS). CAA has developed GDAS, a high-resolution, transportation modeling system for comprehensive simulation of end-to-end deployment of troops, equipment, and supplies from CONUS/OCONUS origins to theater tactical assembly areas (TAAs). GDAS, which combines a multi-modal entity model with a relational data base system, provides seamless simulation of movement of forces from origin to within theater destination. GDAS is unique in its capability to distribute distinct types of cargo onto vehicles of multiple modes (e.g., road, rail, air, sea, pipeline, inland waterway) across an expandable global network with detailed facility structure. GDAS combines scheduling techniques for effective selection of mode, route, and assignment of vehicles with an objective of achieving timely deployment in combination with efficient use of resources based on user priorities. The data structure is expandable by network, vehicle type, and facility type. Tools for preventing data inconsistencies have been built into the relational data base. Recent major applications include the Reception, Staging, Onward Movement, and Integration plus Strategic (RSOI-S) Study, the Support Force Requirements Analysis FY 2005 (SRA-05) Study, the Decision Support Model –

RSOI (DSM-RSOI) Study, the Strategic Lift Tradeoff (STRATLOFF) Study, and support for other analyses, including the Quadrennial Long-range Deployment Analysis for ODCSOPS, Force XXI and the deployment effects of WMD attacks on CONUS ports. Most recent study applications include Total Army Deployment Analysis (TAA-07) (addresses origin to tactical assembly area, chemical attack effects on theater RSOI, movement of units from postures of engagement and trans-load operations) and support to the ARSTAF on the OSD sponsored Mobility Requirements Study – 2005 (MRS-05) and Task Force Hawk Deployment Analysis. Other applications include USTRANSCOM analysis of the Voluntary Intermodal Sealift Agreement (VISA). Formal GDAS training has been conducted at both CAA and USTRANSCOM, and installation discs and user manuals have been released to interested groups. GDAS expansion during FY 99 included expansion of graphical interface capability within the relational data base system (Microsoft ACCESS 97) and work to make the model HLA compliant by end FY 00.

Mobilization Capabilities Evaluation Model (MOBCEM). MOBCEM will simulate the mobilization process for units and individuals from home station to port of embarkation (POE). The MOBCEM prototype model completed in FY 95 was successfully evaluated and is now the basis for full-scale model development, which began in January 1996 and is currently in the final stages of Phase II. While the prototype concentrated on activities at the Mobilization Station/Power Projection Platform, Phase I development incorporated home station processing, requisitioning, transportation between stations and depots, and design of the interface of MOBCEM with deployment models. Phase II includes design and implementation of training centers, CONUS replacement centers, and POEs, as well as an extended GUI with additional output reports and graphics. Phases I and II will constitute the Army version of MOBCEM, expected to be completed in the spring of 2000. The mobilization processes of the other services will be added in Phase III. MOBCEM will be the mobilization component of the Joint Warfighting System (JWARS) under development by OSD.

Methodology Improvement Efforts -

Concepts Evaluation Model (CEM). The CEM is a computer simulation model of ground and air warfare operations used by CAA to conduct analysis of the capabilities of given forces engaged in warfare at theater level or to determine the requirements for forces to meet a given conflict situation. Previously, the CEM was modified to permit introduction of personnel casualties and equipment contamination due to chemical weapon employment and to enhance deep fire capability to more adequately reflect the commander's strategy. Following successful transport of the model to the laptop PC environment using a Unix-like operating system, CEM has been used several times by a team of analysts deployed OCONUS for in-the-field campaign analysis. Other improvements included expansion of the number of weapon systems which can be treated in the model, development of the capability to treat the campaign as a series of planned phases with user-controlled force reorganizations between phases, and the development of an extensive new data postprocessing capability using standard data base and spreadsheet tools and a graphical user interface to provide the user with a greatly expanded and highly flexible system for the analysis and display of campaign simulation results.

Stochastic Concepts Evaluation Model (STOCEM). A stochastic version of the CEM, called STOCEM, provides users the option of treating certain CEM processes--including commanders' decisions, the assessment of combat attrition, the disposition of casualties and of combat-damaged vehicles, and the movement of engaged forces--as stochastic (based on statistical distributions) rather than deterministic (based on expected values). STOCEM research has examined the sensitivity of the most critical simulation results to the specific CEM processes which are treated stochastically, using two scenarios, the Northeast Asia and Southwest Asia campaigns for the Support Requirements Analysis - 2005 Study (SRA-05), as the test cases. Investigation also continued on the question of alternative ways to treat stochasticity based on the recommendations of the Ardennes Campaign Study (ARCAS), which applied STOCEM to the historical 1944 Ardennes campaign, in order to improve the fidelity and robustness of the simulation. In FY 99 and continuing into FY 00, further efforts

toward STOCEM validation are in progress using historical data and simulations of the July 1943 Battle of Kursk.

Combat Sample Generator (COSAGE). This division-level stochastic simulation model continues to be used to generate weapon system level attrition and expenditure data for use by a number of theater campaign models, including, but not limited to, the CAA CEM, FORCEM, and CAMIO models. Major changes to the functionality of the model are planned for FY 00. During FY 99, attention has been concentrated on reducing the effort required to prepare input data, run the model, and analyze the results, with the aim of improving the quality of the final product. To this end, the COSAGE Data Management System (CDMS) project, organized COSAGE input data into tables in a relational data base management system with automated data generation and checking, under control of a graphical user interface for simple and rapid data manipulation. This work was completed in early FY 99 and effort since then has been concentrated on implementation of the final system component, a much more comprehensive and sophisticated graphical user interface for the model user to view, update, display and check model input data. Similar effort was completed in FY 99 on the development of a whole new set of postprocessor methods for analysis of model output data, using data base management systems and spreadsheet applications.

Data Support for Simulation Models. Over the past several years, considerable effort has been devoted to the application of graphical user interface techniques and data base technology to managing, checking, displaying, and analyzing both input and output data of CAA models. Pre- and postprocessor developments for CEM, COSAGE, GDAS and MOBCEM have been mentioned above. In addition, several independent data base development efforts for simulation model support have come to fruition in FY 99. These include a formal data base for weapon system performance data used in COSAGE, which will eventually be linked to the model through a preprocessor; a data base management system, supported by the National Ground Intelligence Center (NGIC), for threat force and equipment data; and a collection of data bases for mostly US force, equipment, transportation, deployment, and performance data, which is easily accessible throughout CAA by user query capability on the internal CAA web. Concurrently, a major interagency effort has been initiated, chaired by the Directors of CAA and Army Materiel Systems Analysis Agency (AMSAA), to streamline and improve the generation and distribution throughout the Army of basic systems data used in models and simulations. The Systems Data Acquisition Process Action Team, with membership from TRADOC Analysis Center (TRAC), Army Research Laboratory (ARL) and NGIC as well, took weapon/munitions lethal area and probability of kill data as the first case and, after analyzing current processes, developed an action plan involving all members of the PAT, for achieving the recommended process improvements. The action plan is now being implemented, and plans are being made to address other data types.

INFORMATION TECHNOLOGY (IT)

The Center strives to achieve a hardware and software environment which places at the disposal of each analyst an automation tool set sufficient to meet that analyst's needs. This tool set is designed to be flexible so that it can be readily modified/enhanced to meet changing needs in a reasonable manner. Through networking of individual computers and cross-platform software compatibility tools, this seamless analyst's environment is rapidly becoming reality. During a 3-year aggressive IT modernization effort, work stations and network assets have been replaced and/or upgraded to gain this working environment. Acquisitions were made to continue the modernization by dealing with approximately one-third of the IT assets and targeting them for enhancement/replacement with state-of-the-art upgrades. The following significant automation items have been added:

- Portable/notebook Pentium computers (23)
- Pentium-based PCs (27)
- Networked Enterprise color laser printer
- Windows NT servers and Novell 4.1 upgrade
- Additional Silicon Graphics workstations (3)
- Network upgrade to 100 Mbps for half the PCs

MISSION AND MANAGEMENT SUPPORT

PERSONNEL MANAGEMENT

Organization and TDA

- **Structure.** CAA continued operating as a flat organization with 11 division chiefs reporting to the Director (reference Chapter 1, Figure 1-2).

- **TDA.** The FY 00 TDA authorized 126 civilian and 43 military positions for a total of 169 employees. The Center designated 5 positions for the Student Employment Program (SEEP) resulting in the hiring of 10 students. The Center is allowed to hire two students for each TDA authorization.

- **High Grade Cap.** The number of GM/GS-14s and 15s continued to be managed.

- **Relocation.** Implementation of the 1995 Base Realignment and Closure (BRAC) directive to relocate the Center to Ft. Belvoir, Virginia was finalized. The Center moved into the new facility 25 March 1999.

- **Personnel Strength.** FY 99 personnel end strength by quarter were as follows:

CIVILIAN

Quarter	Authorized	Assigned
1	124	120
2	124	118
3	124	114
4	124	113

MILITARY

	Authorized			Assigned		
Quarter	Off	Enl	Tot	Off	Enl	Tot
1	53	1	54	49	1	50
2	53	1	54	51	1	52
3	53	1	54	49	1	50
4	53	1	54	47	1	48

OPERATING BUDGET RECAP

A summary of the Center's FY 99 budget execution, by major expense category is provided below. The Center's direct funding obligation rate was 99.99 percent . External funding obligation rate was 100 percent .

Budget Category	Direct Funding (OA 22 Provided) ($000)	External (Outside Agencies) ($000)
Payroll & Benefits	$9,253.8	
ORSA CELL/ISC	$77.0	
Maintenance	$89.0	
Security	$400.0	
Communications	$187.0	
Licenses & Leases	$218.7	
Supplies & Equipment	$510.6	$182.0
Reproduction	$25.0	
Travel	$135.8	
Training	$120.6	$15.0
Awards	$130.0	
Study Support	$780.0	$140.0
Total Direct Funding	$11,927.5	$337.0

The Center was able to fund essential programs with its direct funding authority; the Center also made significant monetary commitments to model upgrades and moderate monetary commitments to computer hardware improvements. The Center's move to Ft. Belvoir resulted in less cost, thereby allowing more funds toward other budget items.

External agencies provided CAA with direct funding or executable funds to assist CAA with different specific missions. The outside assistance resulted in allowing flexibility in the execution of our operating budget. The following is a list of major funding provided directly to CAA or spent on behalf of CAA from outside activities.

- $160K - From the ISC for ADP improvements
- $90K - From EUSA/USFK for Korea travel
- $50K - From EUSAOR for HLA compliance
- $90K - From AMIP standards development.
- $150K - BRAC for funding move to Ft. Belvoir.

SECURITY

Orientation and Training. The CAA Security Office conducted the following activities: Center security procedures presentations to CAA Newcomers' Orientation class and the annual NATO security access briefing. The SAEDA briefing was given to all CAA employees in November 1999.

Inspections

- The annual NATO security inspection was conducted by the Office of the Central US Registry, NATO, during May 1999, and no major discrepancies were noted.

- The Physical Security Survey inspection was completed April 1999 by Mr. Robert Upperman, Chief, Ft. Belvoir Physical Security Office. No major discrepancies were noted.

- The annual TOP SECRET inventory was conducted during June 1999 by the Top Secret Control Officer and an individual from the Mobilization and Deployment Division. A complete accounting was made of all TOP SECRET documents held by the Center.

Other

- Contract awarded to Lockheed/Martin to furnish and install control system for the new building at Ft. Belvoir.

- Updated all SCI billets, submitting changes to DA/SSO.

- Updated the Occupant Emergency Plan and distributed changes to affected personnel.

- HQDA/SSO approved SCIF.

LOGISTICS

Procurement Actions. The Center Information Technology modernization effort, described on page 4-4, consisted of many acquisition actions and several contracting procedures such as the IMPAC credit card, governmentwide acquisition contracts (GWAC), task orders, and indefinite delivery/indefinite quantity (IDIQ) contracts. Several large-item purchases were completed with considerable savings on these investments and with less processing time.

Security System & Guard Contracts. In FY 99, the Center for Army Analysis relocated from a leased facility in Bethesda to a new government-owned building at Ft. Belvoir, VA. The new building required a security system and security guards which required contracting actions. The security system contracting action was awarded to Lockheed Martin on a delivery order contract, and the security guards were contracted on a multiyear basis.

Moving Contract. Ensured that the expensive information technology equipment and secured information files were safely and securely relocated to the new building. The move was successfully accomplished in March. Only minor problems occurred.

Credit Card. The government IMPAC credit card was used to purchase software maintenance as well as other computer supplies. No unusual purchases were made this year with the credit card.

PUBLICATIONS, GRAPHICS, AND REPRODUCTION

Equipment and Services. Publications Center continued to provide editorial, keyboarding, revision, data conversion, data archive and restoration, graphic arts, audio-visual, and photographic support to the Center. Hardware and software were upgraded as needed to provide complete service to all customers.

Publications. During the past year, Branch personnel assisted in the preparation, publication, and dissemination of approximately 44 official documents, including study reports, technical papers, research papers, memorandum reports, and special projects for AORS and MORS submission. Other projects included preparation of special displays for the MORS and AORS Symposia, Human Dignity Council, Federal Women's Program, Association of the US Army (AUSA), Black History Month,

Hispanic and Asian-American Heritage as well as CAA social functions and special workshops and political-military games.

Reproduction. Following the move to Fort Belvoir, Printing Control Officer contacted the Defense Automated Printing office on post to establish procedures for reproduction of the Center's documentation. Classified reproduction is done at the Quantico location and unclassified is prepared at the Fort Belvoir print plant. Special color projects are sent to the Fern Street location. Service and turnaround time have been excellent overall. This year between the Carderock location and Fort Belvoir, 21,325 classified impressions and 165,673 unclassified impressions were produced.

ANALYTICAL EFFORTS COMPLETED BETWEEN FY 95 AND FY 99

This chapter contains a title listing of all analytical efforts completed by CAA during the period FY 95 through FY 99. Contact CAA (ATTN: CSCA-MS) if information is needed for CAA analytical efforts completed prior to FY 95.

FY 99 STUDIES

ACRONYM	TITLE	SPONSOR
ACT	Analyzing Complex Threats	DCSOPS
APSA07	Army PTD Support Analysis FY07	DCSOPS
AT/FP	AntiTerrorism/Force Protection Study	DCSOPS
JCHEMRATES IV	Joint Service Chemical Defense Equipment Consumption Rates 4	DCSLOG
ONE	OFP New and Extended	DCSOPS

FY 99 QUICK REACTION ANALYSES, PROJECTS & RESEARCH ANALYSIS ACTIVITIES

ACRONYM	TITLE	SPONSOR
A-BETA	AMSAA Beta Test	HQDA
ACT-PAC	Analysis of Complex Threats – Pacific	PACOM
ADAPT	Analyzing Deployed Applications of PV in Theater	DCSLOG
ADOS07	Army Digitization Office Support TAA-07	DCSOPS
AMIP-MOB	Army Model Improvement Program - Mobilization	CAA
APAB-PITAA	APAB-PI for TAA	DCSOPS
APL-980P	APL Use Moratorium Effect on 98 OPLAN Update	EUSA
ARDOMS	Army Dependence on Contractor Maintenance and Support	DCSOPS
ASK	Air Sensitivity Korea	DCSOPS
ASRA-05	Assessment Support of RCE Alternatives - 05	DCSOPS
ATFP R 98	ATFP Response Issues Workshop 98	DCSOPS
ATFP WG 98	Antiterrorism Force Protection Work Group 98	DCSOPS
BaseComp-05/07	Baseline Comparison of TAA-05/07	DCSOPS
BedReq-07	Bed Requirements for TAA-07	DCSOPS
BioCamp-07	Bio Excursion Campaign Analysis – TAA-07	DCSOPS
BioTRI	Bio Threat Response Initiative	DCSOPS
BIOTRI IW	Bio Threat Response Initiative Issues Workshop	DCSOPS
BIP	Brcko (BERCH-ko) Informatics Project	USAREUR
C2NC2-SRA07	Comparison of Chemical & No Chemical Campaigns – SRA-07	DCSOPS
C2P2	Command and Control Protect Plan	DISC4
CACNC-07	Campaign Analysis for Chem and No-Chem Comparison 2007	DCSOPS
CALAA	Compendium of Aggregate-Level Attrition Algorithms	HQDA
CasCount-07	Casualty Counts for TAA-07	DCSOPS
CASRA-07	Campaign Analysis for SRA-07	DCSOPS
CCA	Campaign Concept Analysis (E/W)	EUSA
CCIA	Chemical Casualty Integration Analysis	DCSPER
CETOL	Chemical Effects on Theater Operational Logistics	HQDA
ChemCamp-07	SWA Campaign Analysis for SRA-07	DCSOPS
CHEMWINT07	Support to TAA-07 SWA with reduced warning	DCSOPS
Convent-07	Conventional Campaign for Support Requirements Analysis-2007	DCSOPS
COSSWA99	COSAGE - SWA Current Year	DCSOPS
CSASP-NEA	Chief of Staff of the Army Special Project - NEA	DCSOPS
CSASP-SWA	Chief of Staff of the Army Special Project - SWA	DCSOPS
CSASPT	Analytical Support to the Chief of Staff, US Army	DCSOPS
CSASPT-LD	Analytical Support to the Chief of Staff, US Army, Support Force Impacts	DCSOPS
DIGEX SPA	Digitization Exercise System Performance Analysis	DUSA-OR
EPACC	Estimation of Potential Army Contractor Casualties	ASA
FORMOST	Force Modernization Strategies	SARD

FSA-98	FROKA Sector Analysis	EUSA
FSQRA	FastShip Atlantic NDF Proposal: Quick Reaction Analysis	DCSLOG
HDI R 99 IW	Homeland Defense Initiative Response 99 Issues Workshop	DCSOPS
I-PAPA II	Implementing - Pollution Abatement and Prevention Analysis	ACSIM
INCAPR	Installation Capabilities and Resources	ACSIM
JAVREQ	Javelin Requirements	DCSOPS
JPACS	Joint Pacific Arms Control Study	EUSA
JWARS	Joint Warfare Analysis System Development	DUSA-OR
JWARS DS	Joint Warfare Analysis System Development	DUSA-OR
JWARS-1	JWARS Land Warfare IPT Support (Part 1)	OSD
JWARS-AT	Joint Warfare System (JWARS) Alpha Test	DCSOPS
MEADS-CSA-I	MEADS Cost-Share Analysis Phase I	DCSOPS
MEADS-CSA-II	MEADS Cost-Share Analysis Phase II	DCSOPS
MECASA	Medium Extended Air Defense System Campaign Support Assessment	DCSOPS
MISRO	Modernization Impacts of Strategic Responsiveness Options	DCSOPS
MORTI	Modeling of Restoration Technology and Investments	ACSIM
MORTI-II	Modeling to Optimize Restoration Tech & Investments - II	ACSIM
MTOF01	OFP New and Extended	DCSOPS
MTOF02	OFP New and Extended	DCSOPS
MTOF03	OFP New and Extended	DCSOPS
MTOF04	OFP New and Extended	DCSOPS
MTOF05	OFP New and Extended	DCSOPS
MTOF06	OFP New and Extended	DCSOPS
MTOF07	OFP New and Extended	DCSOPS
MTOF08	OFP New and Extended	DCSOPS
MTOF09	OFP New and Extended	DCSOPS
MTOF10	OFP New and Extended	DCSOPS
MTOF11	OFP New and Extended	DCSOPS
MTOF12	OFP New and Extended	DCSOPS
MTOF13	OFP New and Extended	DCSOPS
NAMSAN 99	Joint Pacific Arms Control Study Phase III -Chem- Bio Nonproliferation IW	CFC
NAMSAN IW	NAMSAN Issues Workshop	CFC
NAMSAN WGs	NAMSAN Working Groups	CFC
NEO-SIM	Non-Combatant Evacuation Operation - Simulation Model	USAREUR
OFP-FLOW1	OFP Generated Force Lists for inclusion in FLOW, Move 1	DCSLOG
OFP-MTWPH1	Objective Force Planning-Post Hostilities for 2 MTWs	DCSOPS
OFP-MTWPH2	Objective Force Planning-Post Hostilities for 2 MTWs	DCSOPS
PA99	Patriot Leaker Analysis 99	EUSA
PEPPR	Purpose of Environmental Policy and Program Requirements	ASA
POE-2MTW	Posture of Engagement-Impact on 2 Major Theater Wars	DCSOPS
POMMR	POM Movement Requirements 2005	DCSOPS
POMMR-CP	POM Movement Requirements 2005 Challenging POE	DCSOPS
POMMR-DPG	POM Movement Requirements 2005 DPG Mix	DCSOPS
POMMR-MP	POM Movement Requirements 2005 Moderate POE	DCSOPS
PRAIDS	Potential Rapid Assessment and Initial Detection Sitings	HQDA
PS 99	PATRIOT SHIELD 98 Political-Military Game	DCSOPS
PT 99	PETRI 99	DASG
PYONG-HWA99	PYONG-HWA99	CFC
RCTIFYRS-ER	RCTIFYRS Extended to include Range Throughput	DCSOPS
RepNeed-07	Replacement Needs for TAA-07	DCSOPS
SADE II	Stochastic Analysis for Deployments and Excursions II	DCSOPS
SARDE	Stochastic Analysis of Resources for Deployments and Excursions	DCSOPS
SCAPAT	Systems Characteristics Acquisition Process Action Team	CAA
SIMMR	Strategic Implications of the Massachusetts Military Reservation	ASA
SMOHP	Streamlining Management of Historic Properties	ACSIM
SNAFU	Specified Nondoctrinal Adjustments to Ammunition and Fuel	DCSLOG
SPT J8	Support to Joint Studies and Analysis	DCSOPS
SRA-07 BC/DA-CH	SRA-2007 Base Case Deployment Analysis – Chemicals	DCSOPS

SRA-07 BC/DA-NC	SRA FY 2007 Base Case Deployment Analysis-No Chemicals	DCSOPS
SRA-07 DA-POE	SRA 2007 Deployment Analysis - Postures of Engagement	DCSOPS
SRA-07 DA-TO	SRA 2007 Deployment Analysis - Transload Operations	DCSOPS
SRA-07 RDA	SRA-07 Relook Deployment Analysis	DCSOPS
STA	SKILLTEMPO Assessment	PERSCOM
STRATMODS	Strategic Modernization Strategies	DCSOPS
SUMRA	Support for Modernization Risk Assessment	DCSOPS
SWA SRA-05	Support Requirements Analysis - 05	DCSOPS
TAA-TBM/E	TBM Leakage for MTW-E Using EADSIM	DCSOPS
TAA-TBM/W	TBM Leakage for MTW-W Using EADSIM	DCSOPS
TAA-WMD	WMD Warfare in Total Army Analysis - 2007	CAA
TAA07FIP	TAA-07 Foreign Intelligence Preparation	CAA
TF HAWK	TF HAWK Deployment Methodology Analysis	CAA
TRAILR	Training Land Requirements	DCSOPS
TRCMAN	TDA Requirements Calculations and Manpower Analysis	DCSOPS
US-CA ORS	US/Canadian Operational Research Symposium	DUSA-OR
VAA: CARAFE	VAA: Crusader and RAH-66 and FSCS Evaluations	DCSOPS
VRD	Very Rapid Deployment	DCSOPS
VRDAAS	Very Rapid Deployment by Air and Sea	DCSOPS

FY98 STUDIES

ACRONYM	TITLE	SPONSOR
I-PAPA	Implementing Pollution Abatement and Prevention Analysis	ACSIM
KOSAVE II	Kursk Operation Simulation and Validation Exercise II	CAA
NCIA-3	Nuclear-Chemical Impact Analysis - 3	DCSOPS
PERICLES II	Political & Economic Risk in Countries & Lands Eval Study II	DCSINT
SADE	Stochastic Analysis for Deployments and Excursions	DCSOPS
VAA 5	Value Added Analysis Phase V (POM 00-05)	DCSOPS
WARREQ-05	Wartime Requirements Near Simultaneous Dual MRC, FY05	DCSOPS

FY 98 QUICK REACTION ANALYSES, PROJECTS, & RESEARCH ANALYSIS ACTIVITIES

ACRONYM	TITLE	SPONSOR
2ID-nK	COSAGE 2 ID TOE vs nK NBC Analysis	CAA
AAA-J	Antiarmor Assessment for the Country of Jordan	ARCENT
ABTMOD	Air Breathing Threat (ABT) Model Development	CAA
ACE	Analysis of Class II Excursion	DCSOPS
ADIOS	Army Digitization of Support	DCSOPS
AINTEG	Army International Environmental Group	ASA
AKA	Automated K-kill Analysis	CAA
ALPH	Army Long-term Privatization of Housing	ACSIM
ANVIL 2	ANVIL 2 Campaign Results Comparison	ARCENT
ANVIL 2-C	ANVIL 2 Campaign Results Comparison Support	ARCENT
ATSA	Annual Training Support Analysis	DCSOPS
AVENGERS	Alternative Engineer Requirements Study	CAA
BS97	Bright Star 97	ARCENT
CALDRUG	Cost Analysis for the Land Disposal Restriction Utah Group	ASA
CALKA	CALAPER K-kill Analysis	CAA
CANCIA	Campaign Analysis for Nuclear and Chemical Impact Analysis	DCSOPS
CAPP	COSAGE Automated Post-Processor	CAA
CAPP DB	COSAGE Automated Postprocessor Data base	CAA
CATRP	Campaign Analysis for Tiered Readiness Postures	DCSOPS
CCTAG	Climate Change Technology Advisory Group	ASA
CD	COSAGE Digitization	CAA
CDMS-II	COSAGE Data Management System - Phase II	CAA
CESC	Casualty Estimation Steering Committee	DCSPER

CHDB	Catalog of CAA's Computerized Historical Data Bases	CAA
CHEMSORT	Chemical Degrade of Air Sorties	EUSA
CHEMWINT II	Chemical Warfare Integration in the CEM Follow-on	CAA
CLASSACT	Logistics Analysis for G-3 OPLAN	ARCENT
COA1-98OP	COA 1 Analysis - 1998 OPLAN Update	EUSA
COA3-98OP	COA 3 Analysis - 1998 OPLAN Update	EUSA
COAA-98OP	98 OPLAN Update COA Analysis	EUSA
COBECAS	Cost-Benefit Analysis of the Environmental Compliance Assessment System	ASA
COFA 98	COFA FY 98	CAA
COHDAB	COSAGE History Data Base	CAA
COJ-8	COSAGE J-8 Support	JCS
CRATER	CONUS Residual Forces Available for Terrorist Response	DCSOPS
DODIG-AUD	Support to DODIG Audit	HQDA
EADSIMCAP	Extended Air Defense Simulation Capability	CAA
EKHUD	Enhancement of Kursk Historical Unit Data	CAA
ELOC_K	Effect of Leakers on Korea Campaign	DCSOPS
ERTAG	An Examination of RAID Team Alternatives using GBASE	DCSOPS
ESEI	Equipment Set for European IPS	DCSOPS
FAO	Force Augmentation Options 98	EUSA
FAST ANC-R	FASTALS Analysis of Campaign Results Using Automated K-kill	CAA
FCBETU	FORCEM Chemical/Biological Effects Tables Update	DCSOPS
FEMTO 98	FEMTO 98	DASG
FORMS	Force Mix Study	DCSOPS
GBASE	Graphically-Based Analysis System - Enhanced	DCSOPS
GDAS-PUR96	GDAS - Purchase Order FY 95/96	CAA
GDAS-X	Global Deployment Analysis System-Expansion	CAA
GTW	Go To War	DCSOPS
GTW2	Go To War Phase II	DCSOPS
HAMMUR	Historical Ammunition Rates	CAA
HAUTE	Hierarchial Analysis of USARPAC Theater Engagement	USARPAC
ICAG	Investigation of CAA Access to GCCS	CAA
JPACS-II IW	JPACS Phase II KIDA Chem-Bio Counterproliferation IW	EUSA
KOLA	Keepout Level Assessment	DCSOPS
KPOLA	Kill of Phased Offline Attrition	CAA
LICOH	Life Cycle Costs of Helicopters	DACS
LONGREQ	Longbow Requirements	DCSOPS
LSC2	LSC2, CFC Draft Campaign Concept, COA 1	CFC
LSC3	LSC3, CFC Draft Campaign Concept, COA 3	CFC
MAD BARC	Methodology Development & Demo for Bde & Above Recap Cost	CAA
MAT-OTSG	Medical Analysis Tool Model Evaluation	DASG
MRC-E AC	TAA-05 MRC-East Adverse Case	DCSOPS
NEWTRD	New Effects from Water Reduction	DCSOPS
NPSS-E	Near Peer Scenario Samples - Europe	DCSOPS
OJE-MOBDEP	Operation Joint Endeavor-Mobilization &	CAA
OLD	Optimal Laydown	EUSA
PAEKTU 98	PAEKTU 98 Political-Military Game	EUSA
PEA	Patriot Engagement Analysis	EUSA
PET	Preprocessor for Eagle Terrain	DUSA-OR
PHOENIX 98	WMD Terrorist Response Study - PHOENIX 98 Pol-Mil Game	DCSOPS
PMaST	Protective Mask Sensitivity to Toxicity	DCSOPS
PUP	Privatizing Utility Programs	ACSIM
QDR III-LC	QDR Large Competitor/Near Peer Parallel Effort Support	DCSOPS
QUAILMAN II	Quality of Life Measurement and Analysis II	ACSIM
RAA-2000	Revolution in Analytical Affairs - 2000	DUSA-OR
RELAPS-98	Replacement Laptops - 1998	CAA
ROKJCS	ROK JCS Defense Concept and Security Zone Analysis	EUSA
SCE-98	Strategic Crisis Exercise - 1998	USAWC
SFA	Strike Force Analysis	TRADOC
SHORAD-KLS	Short-range Air Defense (SHORAD) Kill Study	CAA
SPOC	Space Operations Cooperation	USA SSDC
SRA-05 R2 DA	SRA-05 Required/Resourced Forces Deployment Analysis	DCSOPS
SRX-1-98	SRX-1 "The Day After the Strategic Crisis of 2008"	DUSA-OR

SURGE-05	Surge Movement Requirements - FY 2005	DCSOPS
TAA/TLC-BMRK	TAA/TLC Benchmark Study	CAA
TAA05 FFR	TAA-05 Force Feasibility Review	DCSOPS
TAC-NEA	TACWAR 5.0 Upgrade in NEA	CAA
TAC51-NEA	TACWAR 5.1 Upgrade in NEA	CAA
TACR-DA	Tiered and Cyclic Readiness - Deployment Analysis	DCSOPS
TAF21-AA	Theater Analysis Force XXI - Airlift Analysis	DCSOPS
TAF21-R	Theater Analysis for FXXI - Revised	DCSOPS
TFXXI DA	Theater Analysis Force XXI - Deployment Analysis	DCSOPS
TLC	Trends in Land Combat	OSD
TMD FOA	TMD Follow-on Analysis	EUSA
TMD FOLKS	TMD Follow-on Korea Support	EUSA
TRAA	Tiered Readiness Analysis and Assessment	DCSOPS
TRAC	Tiered Readiness Analysis of Costs	DCSOPS
TRS05	Theater Resolution Scenarios (TRS) for TAA05	TRADOC
US-UK PMGS 98	US-UK Political-Military Gaming Seminar 98	DUSA-OR
VOYAGEUR 98	US-Canadian Military Exercise Program Support	DCSOPS
VRD-TAPC	Vulnerability Factors for Total Army Personnel Command	TAPC
WINFORCE2A	Winforce 2.0 Completion and Fielding	CAA
WMD TRS IR	WMD Terrorist Response Study Integrated Response IW	DCSOPS
WMD TRS MTOF	WMD Terrorist Response Study MTOF Issues Workshop	DCSOPS
WMD-JWG	Weapons of Mass Destruction Joint Working Group	DCSOPS
WMD-TR/DA	WMD-Terrorist Response/Deployment Analysis	VCSA
WMD-TRS	Weapons of Mass Destruction (WMD) Terrorist Response Study	VCSA
WSICEM	Weather Sequencing in CEM	CAA

FY 97 STUDIES

ACRONYM	TITLE	SPONSOR
AFPDA-03	Army Force Planning Data and Assumptions - 2003	DCSOPS
PAR-P4	Personnel Attrition Rates in Land Combat Operations, Phase 4	CAA
SRA-05	Support Force Requirements Analysis 2005	DCSOPS
STALDRUG	Statistical Analysis for the Land Disposal Restriction- Utah Group	USA MEDCOM
STRATLOFF	Strategic Lift Tradeoff	DCSOPS
YATIRP	Yearly Analysis of Techniques for Installation Readiness Prioritization	ACSIM

FY 97 QUICK REACTION ANALYSES & OTHER PROJECTS

05CAN	SRA-05 Campaign Analysis	DCSOPS
ACAR	Authorization of CINC Assets to Requirements	DCSOPS
ADAFSA05	Air Defense Artillery Force Structure Analysis-2005	DCSOPS
ADVReport	Prepare Memorandum Report documenting PHALANX articles	CAA
AF-JCHEM3-UP	Air Force JCHEMRATES III Update	DCSLOG
AFS	Alternative Force Structure	VCSA
AMUCK2-6	Army Modernization Update- a Time- Constrained Problem – 1-6	DCSOPS
APLM	Antipersonnel Land Mine Study	SARD
APLM-NE	Antipersonnel Land Mine Study/NEA	SARD
APLM2	Antipersonnel Land Mine Study 2	SARD
ARCOPLAN	ARCENT OPLAN	ARCENT
ARES	Advance Regional Exploratory System	DUSA-OR
ARFERR-1	Ardennes Fractional Exchange Ratio Research - Phase 1	CAA
ATOMIUM 97	ATOMIUM 97	DCSOPS
BIOCAS	Biological Casualty Assessment Study	PERSCOM

BRACKEN	Theater Model Comparison	DCSOPS
BTP-EXP	Breaking the Phalanx Exploration	DCSOPS
C4ISRID	C4ISRID Influence Diagram Model Construction	DCSOPS
CAC-05	Campaign Analysis - Chemical 2005	DCSOPS
CAF21	Campaign Analysis for Force XXI	CAA
CARDEALR	Calculating Requirements for Deployment/Logistical Resources	USAREUR
CASCOM LPF	Review of CASCOM Logistic Planning Factors – Class V & VII	CAA
CASRA-05	Campaign Analysis for Support Requirements Analysis 2005	DCSOPS
CBMR-WARREQ03	Capabilities-based Munitions Requirements Using WARREQ-03	DCSOPS
COAFIB	Costs of Alternative Forces in Bosnia	DCSOPS
COF-OF	CENTCOM Operational Fires	USCENTCOM
COMP-D2X	Comparison of DAWMS and 2 Other Analyses	DCSOPS
COP98	Combined Forces Command Operations Plan 1998	EUSA
COP98-HI	CFC Operations Plan 98 - High Chem	EUSA
COP98-LOW	CFC Operations Plan 98 - Low	EUSA
COP98-VAR	CFC Operations Plan 98 - Chem/Force Capability Variants	EUSA
COS-J8	J8 Request for COSAGE Combat Samples	JCS
COS-SLOC	TAA-05 COSAGE Data for OSD-SLOC	DCSOPS
COS-USAF	USAF Request for TAA 2005 COSAGE Data	AFSAA
CRD-SSI	Casualty Rates Data for Soldier Support Institute	DASG
CRD-TAPC	Casualty Rates Data for Total Army Personnel Command	TAPC
D-WORRM	Deep Attack Weapons Mix Study Support - WORRM Model	DCSOPS
DAMSA	Decision Analysis for MTMC Site Alternatives	ACSIM
DAWMS (SF)	DAWMS Scaling Factors	DCSOPS
DAWMS-HS	DAWMS Helicopter Sortie Excursion	DCSOPS
DAWMS-LOG	DAWMS Logistics Excursion	DCSOPS
DRM-I	Degrade Risk Matrix	EUSA
DSM-RC	Decision Support Modeling (Resource Constrained)	EUSA
DSM-RSOI	DSM IV - Reception, Staging, Onward Movement, and Integration	EUSA
ECI-SWA-97	Expediting the SWA Counter-offensive	VCSA
EFBALL	Economic Failure Based Upon Albania Lessons Learned	USEUCOM
EN-DSM IV	EN Support to Decision Support Modeling IV Follow-up	EUSA
EXERS97	Exercise Roving Sands 1997	ARCENT
FAO	Force Augmentation Options 98	EUSA
FAR SIDE	Fleet Age Recapitalization - System Input Data Excursions	DCSOPS
FEDEX	Force XXI Echelon Above Division Design Evaluation Excursion	TRADOC
GDAS-MCOM	GDAS Model Comparison	CAA
HARPI	Health Assessment Risk - PERICLES Improvement	DASG
HEADI	Heavy Division Impact	DCSOPS
IAMSEP	Imbedded vs Applique Mix of SEP	PAE
IWSIM	Information Warfare Simulation	DISA
JPACS-IW	JPACS Phase I KIDA Chem-Bio Issues Workshop	EUSA
LSC	Logistical Support to Counteroffensive	EUSA
MARTYRDOM	MARTYR Doing Other Matches	CAA
MERCS-SSA	Measuring Ethnic Religious Communal Stress, Sub-Sahara	USEUCOM
MRED II	Managing Research in Environmental Decision Making II	ACSIM
NEWMEC	New Methodology for Combat Support Companies	DCSOPS
NMC-JCR3	New Mask Concept for JCHEMRATES III	AMC
OFP-I	Objective Force Planning - Workshop 1	DCSOPS
OFP-II	Objective Force Planning - II	DCSOPS
P2POM	P2 Investment Strategies in Support of 98-03 POM	ACSIM
PFMF	Planning Future Military Forces	DCSOPS
POLA	Phased Offline Attrition	CAA
PREMOB-SA	Premobilization Sensitivity Analysis	EUSA
PRISM-97	Partnership for Peace and NATO/MED Working Party Pol-Mil Game	DASG

PTOF	Planning Tool for Operational Fires	ARCENT
QDR I-DC	QDR I - Dynamic Commitment	DCSOPS
QDR I - DCR	QDR I - Dynamic Commitment Revisited	DCSOPS
QDR-FA	QDR Force Assessment	VCSA
QDR-II CA	Quadrennial Defense Review - II Cluster Analysis	DCSOPS
QDRF-RA	QDR Force - Risk Analysis	VCSA
QDRLR-DA	Quadrennial Defense Review Long-range - Deployment Analysis	DCSOPS
RS97	Roving Sands 97	ARCENT
SAAALAAA	Support to the Army Audit Agency's Land Acquisition Analysis	ACSIM
SAMSONITE	Survey of Army Mobility: Strategic Operations, Nat'l Infras, Tech & Equip	DCSLOG
SEACA	Simulation Enhancements from Ardennes Campaign Analysis	CAA
SICS	STOCEM Investigation of COSAGE Sampling	CAA
SMOR	Saudi Military OR Training	DUSA-OR
SOKCOM	SRA-05 Share of Kill Comparison: CAA and CENTCOM	DCSOPS
SRA-05 DA	SRA-05 Deployment Analysis	DCSOPS
SRA-05 DA/BC	SRA-05 Deployment Analysis/ Base Case	DCSOPS
SRA-05 DA/LM	SRA-2005 - Deployment Analysis - LRC/MRC	DCSOPS
SRA05 EC	SRA-05 Early Counter-offensive Excursion	DCSOPS
TA	Transportation Analysis	DCSOPS
TAA CHEM E	Total Army Analysis Chemical Excursion, East MRC	DCSOPS
TAA CHEM W	Total Army Analysis Chemical Excursion, West MRC	DCSOPS
TAA05 WEAR	TAA-05 Wartime Executive Agent Responsibility	DCSLOG
TACWAR-NEA	TACWAR Support to DAWMS DCSOPS Effort in NE	
TAEBAEK 97	TAEBAEK 97 Political/ Military Game	EUSA
TAF21	Theater Analysis for FXXI	TRADOC
TF97	TALKING FISH 97 Political/ Military Game	DCSOPS
TIM	TACWAR Installation and Modification	CAA
TNP	The "New Paradigm"	DACS
TS2TS	Transportation Structure Sensitivity to TAA-03 Stockage	DCSOPS
WARREQ-03C	Wartime Requirements - FY 03 Chemical	DCSOPS
WSR-APC	Warfight Sustainability Report (APCs)	EUSA
WSR-M	Warfight Sustainability Report (Mortar)	EUSA

FY 96 STUDIES

ALCHMMI	Assessment of Log & Costs for Haz Mats Mgmt Implementation	ACSIM
APAB-PI	Active, Passive, Attack, BMC41 - Pillar Integration	USA SSDC
ARCAS-FO	Ardennes Campaign Simulation - Follow on	CAA
DSM IV	Decision Support Modeling IV - Support for CFC/USFK J-5	USFK
ELVS	Evaluating Land Value Study	DCSOPS
ITMD-CAP	Integrated Theater Missile Defense - Capability Assessment	DCSOPS
JCHEMRATES III	Joint Svc Chemical Defense Equipment Consumption Rates III	DCSLOG
KURSK III	The Battle of Kursk, Southern Front - Phase III	CAA
LOGWAR	Impact of Army CSS on Warfighting Capability	DCSOPS
NBCCAS	NBC Casualty Assessment Study	DCSPER
NIA-2	Nuclear Impact Assessment - 2	DCSOPS
PAR-P3	Personnel Attrition Rates in Land Combat Operations, Phase 3	CAA
PASMPR	Prioritization of Army Strategic Mobility Project Resources	DCSLOG
PERICLES	Political/Economic Risk in Countries & Lands Evaluation	DCSINT
PERSEUS	Planning Environmental Resource Strategy Evolution & Util Sty	ACSIM
SRA-03	Support Force Requirements Analysis-2003	DCSOPS
SRA-05C	SRA-05 COSAGE	DCSOPS
SRA05-BC(NS)	SRA-05 MRC(NS) Base Case Campaign Development	DCSOPS
VAA 98-03	Army Program Value Added Analysis 98-03	DCSOPS
WARREQ-03	Wartime Requirements Near-term Simultaneous Dual MRC, FY2003	DCSOPS

FY 96 QUICK REACTION ANALYSES & OTHER PROJECTS

A2MR	Antiarmor Munitions Requirements	DCSOPS
A2R2	Antiarmor Requirements & Resource Analysis Study	DCSOPS
AATOP-02	Army Attack Operations-Northeast Asia 2002	USA SSDC
ABAPM-SWA	Assessment of Banning Antipersonnel Mines - SWA	DCSOPS
AEA-MDSQ	An Examination of Alternative MDSQ Factors	DCSOPS
AMUSE	Assessment of Military Units with Spreadsheet Effort	DCSOPS
APC1-4	Alternate Procurement Campaigns	PAE
ARBATTS	Army Battalions	DCSOPS
ASP 96	Army Strategic Planning Workshop - 1996	DCSOPS
BOSS	Bosnia, SWA Scenario	DCSOPS
BRSA	Brown and Root Substitution Analysis	DCSOPS
CANTELOUPES	Cost Analysis Tool-Estimate Lt Opns Peacekeeping Scenarios	DCSOPS
CAS-TO-SPT	Casualty Estimation w/in CS & CSS Functional Areas	DASG
CATMID I	Campaign Analysis, Integrated Theater Missile Defense Ph I	USA SSDC
CD-SUSA	Contingency Deployment - CAA Support to 3d US Army	ARCENT
CONPLAN 1015RA	Contingency Plan 1015 Requirements Analysis	ARCENT
DAD	Data Analysis of Demography	DCSOPS
DAWMS	Deep Attack/Weapons Mix Study Support	PAE
DAWMS (AD)	DAWMS (Air Defense)	DCSOPS
DAWMS SPT	DAWMS Support	DCSOPS
DFP-K	Dual Force Packages for Korea	FORSCOM
DNBI-EFFECTS	Impact of DNBI Casualty Rates on Theater Force Structure	DCSOPS
DSMIV-WARN	DSM IV - Korea as a Second MRC - Warning Excursions	EUSA
EIC-SWA	Early Counteroffensive Investigations - SWA	DACS
ELVS II	Evaluation of Land Value Study II	DCSOPS
EUCOM-LA	EUCOM Land Mine Analysis	USEUCOM
FAD	Forecasting Available Dollars	DCSOPS
FAR ARMS	Fleet Age Recapitalization - Armored Systems	DCSOPS
FAR COMMS	Fleet Age Recapitalization - Communications System	DCSOPS
FAR FIRES	Fleet Age Recapitalization - Fire Support	DCSOPS
FAR HELOS	Fleet Age Recapitalization - Helicopters	DCSOPS
FAR WHEELS	Fleet Age Recapitalization - Tactical Wheeled Vehicles	DCSOPS
FOCAA	Four Country Analysis of Africa	USEUCOM
FUN-CATS	Functional Category Battle Casualty Rates	USAFISA
GF95	Groundfire 95 Low-level Radiation Issues Workshop	DCSOPS
GHQ-95 PPRDE	Nondivisional Combat Forces Casualty Rates	DASG
GMAS-DA	Ground Maneuver Analysis Support - Data Analysis	DCSOPS
GOU	GCC OPLAN Update	EUSA
GS96	Groundshine 96	DCSOPS
GT96	GDAS-TPFDD 96	EUSA
HEDRISM	Heavy Division Reduction Impact on Strategic Mobility	DCSOPS
HELIARC	Helicopter, Attack/ Reconnaisance - Campaign Modeling	DAIG
ILIB	Impact of Light Brigades on Division Design	TRADOC
ILOOK	Internal Look	ARCENT
ILS2	Internal Look-1015	ARCENT
IPS	DPG IPS Review	DCSOPS
JCBD PRI	Joint Chemical & Biological Defense Program Prioritization	DCSOPS
JTAD BMC4I	Joint Theater Air Defense BMC4I Analysis Working Group	AFSAA
KILBASA	Korea Intermediate Logistics Base Support Assessment	USARPAC
KOBOSH III	Korea, Bosnia, Haiti Analysis, Third Version	DCSOPS
KUTRACE	Kuwait Training Cost Estimate	DCSOPS
LEGAL MIX	LEGAL MIX Support	TRADOC
LOTSA-MSLS	Lower Tier Stockage Alternatives-Missile Inventory Solutions	USA SSDC
MDSQ-EVALU	Minimum Distribution System Quantity Evaluation Update	DCSOPS
MODERN ROK	Modernization of Network in ROK	DUSA-OR
MRED	Managing Research in Environmental Decision Making	ACSIM
OFP	Objective Force Planning	CAA
OP1002-CL	OPLAN 1002 Consumption and Losses	ARCENT
PAM	Prioritization of Antitank Munitions	DCSOPS
PC-96	Pacific Challenge 96 Political-Military Game	DCSOPS
PE-FP	Peace Enforcement - Force Protection	DCSOPS

PHANTOM WARRIOR	Phantom Warrior	ARCENT
PMS	Partial Modernization Strategy	PAE
PMS-EAGLE	Partial Modernization Strategy (EAGLE)	PAE
PV-95	Pacific Vision 95 Issues Workshop	DCSOPS
QUAILMAN	Quality of Life Measurement and Analysis	ACSIM
RDA3	Research, Development, and Acquisition Alternative Analyzer	DCSOPS
SCAT	Support for CSA Testimony	DCSOPS
SNCO	Sourcing NATO Contingency Operations	DCSOPS
SOAP-D	Southwest Asia OPLAN Analysis of Patriot – Deployment	ARCENT
SORREQ	Sortie Requirements	DCSOPS
STAAF	Stability Analysis of Africa	USAREUR
STRAT-3X	Strategic Deployment to Korea and Two Other Pacific Regions	DCSOPS
SW-PREPO	Southwest Asia Preposition Strategy	ARCENT
SWAPP	SWA Additional Patriot Preposition Analysis	ARCENT
TLC-EVAL	Theater Logistics Concept Evaluation	DCSOPS
TLS-ADS	Theater-level Simulation of Ammunition Distribution System	DCSOPS
TMD COEA	Theater Missile Defense COEA	USA SSDC
TMD COEA-2	Theater Missile Defense COEA - Phase II	USA SSDC
TOPR	TAA-03 OSD PA&E Review	DCSOPS
VAA-COMSUP	VAA 98-03 Corps Operations Modeling Support	DCSOPS
VAA-UC	VAA Unit Cost	AMC
WARBLORR	Wartime Based Lieutenant Officer Replacement Requirements	DCSPER
WSR-ARTY	Warfight Sustainability Rpt - Artillery	EUSA
WSR-HELO	Warfight Sustainability Rpt - Helicopters	EUSA
WSR-TANK	Warfight Sustainability Report (Tank)	EUSA
X-MLRS-2	Follow-on Analysis for JPSD	SARD

FY 95 STUDIES

AFPDA 97-03	Army Force Planning Data and Assumptions FY 1997-2003	DCSOPS
EAD-CAS-MET	Echelon Above Division Casualty Estimation Methodology	DCSPER
KAMMO	Korean Ammunition Distribution System Analysis	EUSA
MOBCEM-PD	Mobilization Capabilities Eval Model - Prototype Devlopment	DCSOPS
PAR-P2	Personnel Attrition Rates in Land Cbt Opns, Phase 2	CAA
ROLES/MISSIONS	Analysis Support for Army Roles and Missions	DCSOPS
RSOI-S	Reception, Staging, Onward Mvmt, & Integration - Strategic	EUSA
SEW	Synthesizing Energy Worth	ACSIM
WARPATH	War Reserve Positioned Across Theater(s)	DCSLOG

FY 95 QUICK REACTION ANALYSES & OTHER PROJECTS

95KOR-SEN	Korean Combat Samples with Modified Sensors - 1995	EUSA
AAMAA II	Antiarmor Mission Area Analysis Phase II	DCSOPS
ABC	Artillery Brigade CS/CSS Analysis	ARMY SCI BD
ABC-APR	Analysis of BCTP vs CAA - Ammo Process & Results	DCSOPS
AFPDA-DA	Army Force Planning Data & Assumptions - Document Automation	DCSOPS
ARF	Army Required Forces	DCSOPS
ARSTRAP	Army Strategic Planning Workshops	DCSOPS
BF-95	BLUE FLAG 95	ARCENT
BF-II	BLUE FLAG II	ARCENT
BF3	BLUE FLAG 3	ARCENT
BFIII-S	BLUE FLAG III Support	ARCENT
BLACKJACK 95	Assumptions Working Group for Campaign XXI	DCSOPS
BOST95	BOLD STROKES 95 Pol-Mil Game	EUSA
BRAIN	Bayesian Representation & Analysis in International Negotia	DUSA-OR
CAMPAIGN XXI	Campaign XXI	DCSOPS
CAMRULE	Cost Analysis for Munitions Rule	ASA
CANIA-2	Campaign Analysis Nuclear Impact Assessment - 2	DCSOPS
CARSTAR-94	Campaign Analysis for Army Strategic Force Architecture-94	DCSOPS
CATMID	Campaign Analysis for Integrated Theater Missile Defense	CAA
CORAL REEF	Correlate Funding to Readiness for Reserve Forces	OCAR

CURAM	Chemical Unit Requirements Analysis Methodology	DCSOPS
DFP	Dual Force Packages	FORSCOM
DSM I	Decision Support Modeling - Single MRC	EUSA
DSM II	Decision Support Modeling II- Dual MRC	EUSA
DSM III	Decision Support Modeling III- Support for CFC USFK J-5	EUSA
EBSFI	Enhanced Brigade Support Force Impact	DCSOP S
EUCOM-FRE	HQ EUCOM Force Requirement Exercise	DCSOPS
FACEI	Feasibility Analysis of CTLS-Eagle Interoperability	DUSA-OR
FAST-OR	Force Analysis Spreadsheet Tool - OOTW Requirements	DCSOPS
FOPROA II	Force Projection II	CENTCOM
FREEFALL 95	FREEFALL 95 Political-Military Game	DASG
GHQ-95 P2	General Headquarters Exercise Part 2	DCSOPS
GHQ-95 P3	General Headquarters Exercise Part 3	DCSOPS
GHQ-95 P4	General Headquarters Exercise Part 4	DCSOPS
GHQ-95 P5	General Headquarters Exercise Part 5	DCSOPS
GHQ-PD	GHQ 95 Personnel Data	TAPC
GHQ-PPD	GHQ-95 Peacekeeping Personnel Replacement Data	DCSOPS
GHQ-X95 P-1	General Headquarters Exercise X95 Phase I	DCSOPS
GMAS	Ground Maneuver Army Support	DCSOPS
GMAS-IA	Ground Maneuver Analysis Support - Issue Assessment	DCSOPS
GMAS-II	Gound Maneuver Assessment Methodology - II	DCSOPS
GMAS-NI	Ground Maneuver Analysis Support-Needs Identification	DCSOPS
HL-95	HAMMERLOCK 95 Pol-Mil Game	DASG
JAMIP/JWAR	Joint Analytic Model Improvement Program, Joint Warfare System	DCSOPS
JCBD(NT)	Chemical Joint Service Integration Group Analysis Support	DCSOPS
JROC-TRACK	Tracking JROC through the ARSTAF Lead Agents Working Group	DCSOPS
KAMMO-SLAM	Korean Ammo Distribution System Analysis using SLAM	EUSA
KOBOSH II	Korea, Bosnia, Haiti Analysis, 2d Version	DCSOPS
KURSK II	The Battle of Kursk, Southern Front, a Validation Data Base	DUSA-OR
LIBAITAN	Linking BASOPS Investments to Training & Readiness Analysis	ACSIM
LINGLANG-II	Linguist and Language Analysis II	DCSINT
MINIPOM-95	Value Added Analysis Support to Mini-POM 97-02	DCSOPS
NEARFIA	Northeast Asia Regional Forces Intelligence Assessment	CAA
NEDS	A Nexus of Environmental Decision Making in the Services	ACSIM
NIGERIA-95	NIGERIA-95 Issues Workshop	DCSOPS
NIMBLE DANCER	Nimble Dancer Joint Staff Support	DCSOPS
NKAE	North Korean Artillery Effects	EUSA
OLYMPUS-94	OLYMPUS-94 Pol-Mil Game	USAREUR
PERSREP-GHQX95	Personnel Replacement Requirements Analysis GHQX95 Scenario	PERSCOM
PPROFOR	Power Projection Forces	DCSOPS
PROSPPECT	Plan Research Operations Strategy for P2 Efforts	ACSIM
PSS-VULFACS	Vulnerability Rates for Personnel Service Support Branch	CASCOM
REIN DEER	Researching Environmental Initiatives & Decision Evaluation Rules	ACSIM
REPREPO	Reconstitution of the Prepo-Afloat Package	DCSOPS
RSOI-GDAS	Reception, Staging, Onward Movement, and Integration – GDAS	EUSA
SAIM-11/94	SAMAS November-94 Update of Reserve Component Data	ACSIM
SOA	Stockage Objective Analysis	DCSOPS
SOMR-HA	SRA-03 OOTW Movement Requirements - Humanitarian Assistance	DCSOPS
SOMR-LRC	SRA-03 OOTW Movement Rqmts Lesser Regional Contingency	DCSOPS
SOMR-PE	SRA-03 OOTW Movement Requirements - Peace Enforcement	DCSOPS
SOMR-PK	SRA-03 OOTW Movement Rqmts-Peacekeeping	DCSOPS
SPT2XXI	Analytical Support to Force XXI DCSOPS	
SRA-03 DA	SRA-03 Deployment Analysis	HQDA
SRA-AC(OWIT)	SRA - Adverse Case (Only War in Town)	DCSOPS
SRA03-MED-FACT	SRA-03 Medical Planning Factors Alternatives Analysis	DCSOPS

SUSCM	Support Slice for C-17 Movement	DCSOPS
SWA-FOPROA	Southwest Asia Force Projection Assessment	ARCENT
SWAAGS	Southwest Asia Armored Gun System Effectiveness Analysis	DCSOPS
SWAHAKO	SWA and Haiti's impact on Korea	DCSOPS
T-CAN 02	Tactical Missile Defense COEA Analysis NEA 2002	USA SSDC
TARA	TAA Ammunition Requirements Analysis	DCSOPS
TAURUS-94	TAURUS-94 Pol-Mil Game	USAREUR
TERCDA	TAA-03 Engineer Regional Construction Data and Analysis	DAEN
TOSCA	Tactical Engineering Mobility System O&S Cost Analysis	DCSOPS
TOSFRAM	TAA-03 OOTW Support Force Requirements/Analysis Methodology	DCSOPS
TRAP	Transportation Rail and Pipeline Denial Analysis	DCSOPS
TRSDOC03	Theater Resolution Scenario Documentation for TAA03	DCSOPS
TU-95	Tactical Wheeled Vehicle Modernization Update - 95	DCSOPS
VW	Vigilant Warrior	CAA
WARRU-NEA	WARREQ 01 - Army Reserve Requirements Update - NEA	DCSOPS
WARRU-SWA	WARREQ 01 - Army Reserve Requirements Update - SWA	DCSOPS
WIDCOMP	War Fighting Impact of Delaying the Comanche Program	DCSOPS
WRAC-NEA	Wartime Requirements Adverse Case - Northeast Asia	DCSOPS
WRAC-SWA	Wartime Requirements Adverse Case - Southwest Asia	DCSOPS
XMLRS	Counter-MLRS	SARD

APPENDIX A

DEFINITIONS OF CAA WORK CATEGORIES

This appendix contains short descriptions of CAA's principal work categories.

Study - A major in-house or contract effort which is externally sponsored by a HQDA or DOD staff element, MACOM, or other government agency. The analysis effort generally involves more than one-half of a professional staff year (PSY), and the duration usually exceeds 90 days (reference AR 5-5, AR 5-14, AR 10-88). A study directive is required for all in-house CAA study efforts (DA Pam 5-5). CAA documents the results of studies with a study report.

Quick Reaction Analysis (QRA) - An operational or strategy oriented analysis of a pressing issue(s) conducted on a quick response basis. QRA are externally sponsored and performed in-house. The analysis effort is less than one-half a PSY, and the duration is normally less than 6 months and frequently less than 30 days. CAA documents results of QRAs with a memorandum report.

Project - An in-house or contract analytical support effort undertaken by CAA on behalf of an external sponsor. Projects include CAA analytical support activities such as model validation and verification, peer reviews of studies, and international analytic exchange programs. Projects can range from relatively low-cost, short-term efforts to major efforts equivalent in scope to a study. CAA generally documents results of projects with a technical paper.

Research and Analysis Activity (RAA) - A CAA-sponsored, in-house effort aimed at developing or improving analytical systems or techniques. Includes the development and modification of analytical models and data bases to support the conduct of studies, QRA, and projects. The product is determined by the tasking authority.

CAA Management/Mission Support (MMS) - Selected work efforts supporting internal CAA program management. The product is determined by the tasking authority.

Acronym	Definition
ACSIM	Assistant Chief of Staff for Installation Management
ADA	air defense artillery
AHPCRC	Army High Performance Computing Research Center
AMSAA	Army Materiel Systems Analysis Agency
AOR	area of responsibility
ARCAS	Ardennes Campaign Simulation
ARCENT	US Army Central Command
ARES	Advanced Regional Exploratory System
ARL	Army Research Laboratory
ARPO	Advanced Research Project Office
ASA	Assistant Secretary of the Army
ASAILE	Assistant Secretary of the Army for Installations Logistics and Environment
ATCAL	Attrition Calibration
AUSA	Association of the US Army
AWC	Army War College
BMDO	Ballistic Missile Defense Organization
BRAC	Base Realignment and Closure Commission
BWC	Biological Warfare Convention
C4ISR	command, control, communications, computers, information systems reconnaissance
CALAPER	Calculation of Ammunition, Petroleum & Equipment Rates Model
CASCOM	Combined Army Support Command
CCIR	Commander Critical Information Requirements
CDMS	COSAGE Data Management System
CEM	Concepts Evaluation Model
CENTCOM	US Central Command
CESC	Casualty Estimation Steering Committee
CFC	Combined Forces Command
CHD	conservative heavy division
CHPPM	US Army Center for Health Promotion and Preventive Medicine
CINC	Commander-in-Chief
CINCC	Commanders in Chief of the Combatant Commands
COA	course of action
COEA	cost and operational effectiveness analysis
CONOPS	concepts of operations
CONUS	continental US
COSAGE	Combat Sample Generator
CRAF	Civil Reserve Air Fleet
CS/CSS	combat support/combat service support
CW	chemical warfare
CWC	Chemical Warfare Convention
DA	Department of the Army
DACS	Chief of Staff of the Army
DAMO-FDX	DCSOPS - Force Development Division
DAMO-SSW	DCSOPS - War Plans Division

Acronym	Definition
DAST	Deployable Analytical Support Team
DAWMS	Deep Attack/Weapons Mix Study
DCSOPS	Deputy Chief of Staff for Operations and Plans
DNBI	disease & non-battle injury
DOD	Department of Defense
DOMS	Director of Military Support
DPAE	Director, Program Analysis & Evaluation
DPG	Defense Planning Guidance
DPG-IS	Defense Planning Guidance - Illustrative Scenario
DSM	Decision Support Model
DSS	decision support system
DUSA(OR)	Deputy Under Secretary of the Army (Operations Research)
EAC	echelons above corps
EAD	echelons above division
EADSIM	Extended Air Defense Simulation
EAGLE	A CAA corp-level model
EPA	Environmental Protection Agency
EPW	enemy prisoner of war
ESPC	Energy Savings Performance Contracts
EUSA	Eighth US Army (Korea)
FASTALS	Force Analysis Simulation of Theater Administrative and Logistics Support
FD	Force Development
FEBA	forward edge of the battle area
FIP	foreign intelligence preparation
FORCEM	Force Evaluation model
FORSCOM	Forces Command
FY	fiscal year
GAO	General Accounting Office
GDAS	Global Deployment Analysis System
GUI	graphical user interface
HQDA	Headquarters, Department of the Army
IDA	Institute for Defense Analysis
IPS	Illustrative Planning Scenario
J8	Strategic Plans & Policy
J5	Force Structure Resources & Assessments
JANUS	A TRADOC model
JCS	Joint Chiefs of Staff
JICM	Joint Integrated Campaign Model
JOPES	Joint Operations Planning and Execution System
JTMD	Joint Theater Missile Defense
JWARS	Joint Warfighting System
JWCA	Joint Warfare Capabilities Assessment Group
KCMIA	killed, captured, missing in action
KIDA	Korean Institute for Defense Analysis
KOSAVE	Kursk Operation Simulation and Validation Exercise
LAN	local area network
LDR	land disposal restriction

Acronym	Definition
LMSR	large medium speed roll on roll off
MACOM	major Army command
MISMA	Model Improvement Study Management Agency
MOBCEM	Mobilization Capabilities Evaluation Model
MOG	Maximum On Ground
MOPP	mission-oriented protection posture
MORS	Military Operations Research Society
MR	memorandum report
MRC	major regional contingency
MTCR	Missile Technology Control Regime
MTMC	Military Traffic Management Command
MTOF	mission task organized forces
MTW	major theater war
NATO	North Atlantic Treaty Organization
NBC	nuclear biological & chemical
NEA	Northeast Asia
NIS	Newly Independent State(s)
NG	National Guard
NGIC	National Ground Intelligence Center
nK	North Korea
NLT	not later than
NMS	National Military Strategy
NS	near simultaneous
OCONUS	outside the continental US
OCS-AIG	Office of the Chief of Staff - Army Inspector General
ODCSINT	Office of the Deputy Chief of Staff for Intelligence
ODCSLOG	Office of the Deputy Chief of Staff for Logistics
ODCSOPS	Office of the Deputy Chief of Staff for Operations & Plans
ODCSPER	Office of the Deputy Chief of Staff for Personnel
ODP	Officer Distribution Plan
OFOR	Over the horizon
OFP	Objective Force Planning
OOTW	operations other than war
OPLAN	operation plan
OPORD	operations order
OPTEMPO	operating tempo
OSD	Office of the Secretary of Defense
PA&E	Program Analysis & Evaluation
PAPA	Pollution Abatement and Prevention Analysis
PC	personal computer
PERSEUS	Planning Environmental Resource Strategy Evolution & Utility Study
PFP	Partnership for Peace
PIP	product improvement plan
POC	point of contact
POL	petroleum, oils, and lubricants
POM	Program Objective Memorandum
POMCUS	prepositioned materiel configured to unit sets
PPBES	Planning, Programming, Budgeting, and Execution System
PSM	professional staff month
QDR	Quadrennial Defense Review
QRA	quick reaction analysis
R&D	research and development
RAA	research and analysis activity
RAID	Rapid Assessment and Initial Detection
RAND	RAND Corporation
RALPH	Reduction to the ATCAL (Attrition Calibration) Phase I model
RC	Reserve Component
RCTIFYRS	Reserve Component Training Installation Facility Yearly Requirements Study
RDA	research, development, and acquisition
RJIRTF	Rapid Joint and Interagency Response Task Force
ROE	rules of engagement
ROK	Republic of Korea
ROK MND	Republic of Korea Ministry of Defense
ROKA	Republic of Korea Army
ROKUS	Republic of Korea & US
SAEDA	Subversion and Espionage Directed against the US Army
SAMAS	Structure and Manpower Authorization System
SARDA	Secretary of the Army for Research, Development, & Acquisition
SEC ARMY	Office of the Secretary of the Army
SIMTECH	Simulation Technology
SRA-05	Support Force Requirements Analysis - 2005
SSC	Smaller Scale Contingencies
STELLA	A dynamic modeling software package
STOCEM	Stochastic Concepts Evaluation Model
STON	Short Ton
SWA	Southwest Asia
SW	Operational Capability Assessments - Southwest Asia (CAA Division)
TAA	Total Army Analysis
TACWAR	Tactical Warfare (model)
TAEDP	Total Army Equipment Distribution Program
TARD	Total Army Requirements Determination
TBM	tactical ballistic missile
TDA	table of distributions and allowances
TMD	Theater Missile Defense
TOE	table of organization & equipment
TPFDD	Time-Phased Force Deployment Data
TQM	Total Quality Management
TRAC	TRADOC Analysis Center
TRADOC	Training and Doctrine Command
UJTL	Universal Joint Task List
UK	United Kingdom

Acronym	Definition
UN	United Nations
USAREUR	US Army Europe
USARPAC	US Army Pacific Command
USEUCOM	US European Command
USFK	US Forces Korea
V&V	verification & validation
VRI	Vector Research Institute
WARREQ	Wartime Requirements
WIA	wounded in action
WMD	weapons of mass destruction